

AD-A099 967

FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATL--ETC F/G 1/2  
MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 6. AIRPORT IMPR--ETC(U)  
MAY 80

UNCLASSIFIED

NL

1 of 2  
AD-A  
35067

11

11-11-11

LEVEL III

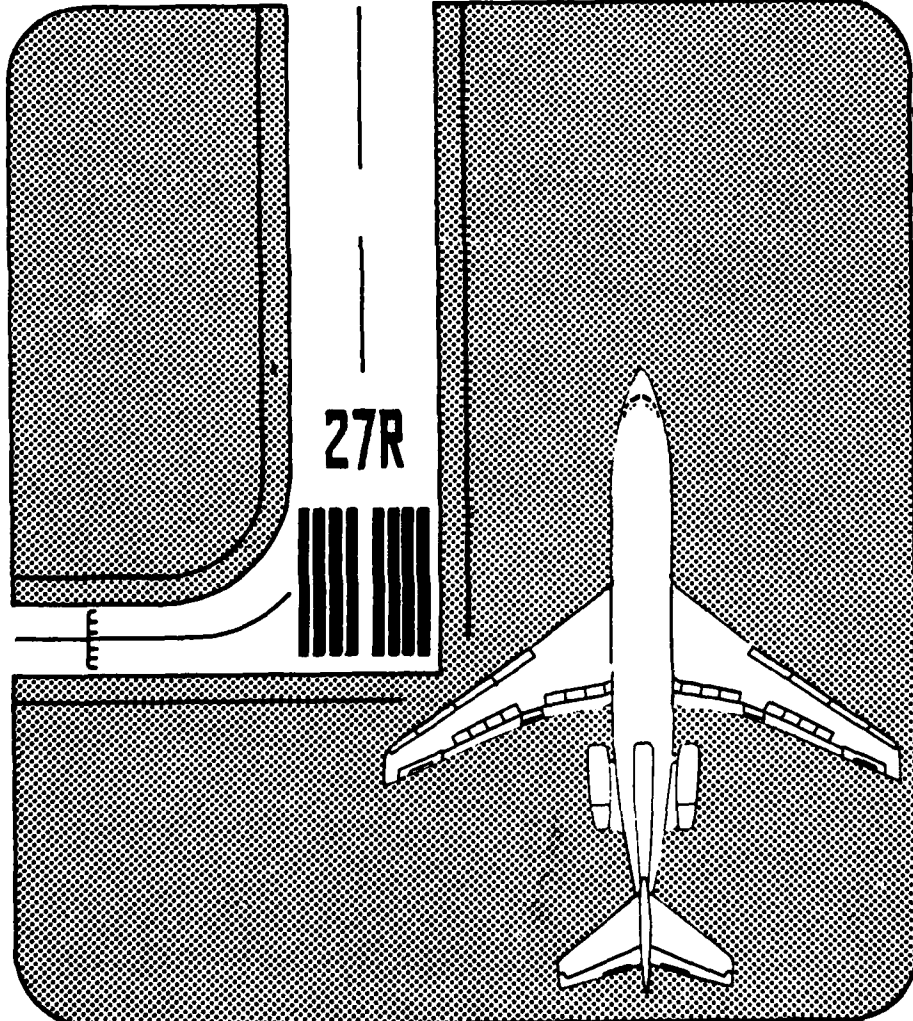
①

# MIAMI INTERNATIONAL AIRPORT

DATA PACKAGE NO. 6

AIRPORT IMPROVEMENT  
TASK FORCE DELAY STUDIES

AD A099967



DTIC  
ELECTE  
JUN 09 1981

S

E

DTIC FILE COPY

MAY 1980

81 6 08 142

12 248

61

MIAMI INTERNATIONAL AIRPORT.

DATA PACKAGE 6.

Number

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

~~MIAMI~~

AIRPORT IMPROVEMENT TASK FORCE DELAY STUDIES.

11 MAY 1980

Prepared by:

ANALYSIS BRANCH, ACT-220  
FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER  
ATLANTIC CITY, NEW JERSEY 08405

422863

## TABLE OF CONTENTS

Item	Description	Page
1	Attachment A - Miami Delay Experiments - Stage 1 and Stage 2	A-1
2	Attachment B - 1983 Airport Improvement Summary	B-1
3	Attachment C - Configurations A and B Model Input Data - 1983 Time Frame	C-1
4	Attachment D - Experimental Results - Miami Stage 1 Delay Experiments	D-1

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

# LIST OF TABLES

Table	Description	Page
1	Miami Delay Experiments - Stage 1	A-2
2	Miami Delay Experiments - Stage 2	A-3
3	Aircraft Separations - 1983 VFR1, Easterly Configuration	C-17
4	Aircraft Separations - 1983 IFR1, Easterly Configuration	C-19
5	Aircraft Separations - 1983 IFR2, Easterly Configuration	C-21
6	Aircraft Separations - 1983 VFR1, Westerly Configuration	C-37
7	Aircraft Separations - 1983 IFR1, Westerly Configuration	C-39
8	Set 1 Demand: VFR Easterly Flow	D-3
9	Experiments 11 and 11A Results	D-5
10	Experiment 14 Results	D-10
11	Set 2 Demand: IFR Easterly Flow	D-14
12	Experiment 9 Results	D-16
13	Experiments 35, 35M1 and 35M2 Results	D-21
14	Experiment 6 Results	D-26
15	Experiment 10 Results	D-31
16	Experiments 21 and 21M Results	D-36

Data Package No. 6  
 Miami International Airport  
 Airport Improvement Task Force Delay Studies  
 May 1980

LIST OF TABLES  
(Continued)

Table	Description	Page
17	Set 3 Demand: VFR Westerly Flow	D-40
18	Experiment 40 Results	D-42
19	Experiment 36 Results	D-47
20	Experiment 37 Results	D-52
21	Experiment 17 Results	D-57
22	Experiment 12 Results	D-62
23	Experiment 12A Results	D-67
24	Set 4 Demand: IFR Westerly Flow	D-71
25	Experiment 15 Results	D-73
26	Experiment 20 Results	D-78

## LIST OF ILLUSTRATIONS

Figure	Description	Page
1	Miami 1983 Airfield Layout	B-5
2	Miami Link-Node Diagram - 1983 Configuration	B-6
3	VFR1 East Comparison: All Improvements but Reliever Airport Upgradings, with 1983 Demand versus No Improvements, with 1983 Demand	D-6
4	VFR1 East Comparison: All Improvements, with 1983 Demand versus All Improvements but Reliever Airport Upgradings, with 1983 Demand	D-11
5	IFR1 East Comparison: No Improvements but Reliever Airport Upgradings and the 1983 ATC System Scenario, with 1983 Demand versus No Improvements, with 1983 Demand	D-17
6	IFR1 East Comparison: All Improvements, with 1983 Demand versus No Improvements but Reliever Airport Upgradings and the 1983 ATC System Scenario, with 1983 Demand	D-22
7	IFR East Comparison: IFR2 Weather with Today's Airport and 1978 Demand versus IFR1 Weather with Today's Airport and 1978 Demand	D-27
8	IFR2 East Comparison: No Improvements but Reliever Airport Upgradings and the 1983 ATC System Scenario, with 1983 Demand versus No Improvements, with 1978 Demand	D-32

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

LIST OF ILLUSTRATIONS  
(Continued)

Figure	Description	Page
9	IFR2 East Comparison: All Improvements, with 1983 Demand versus No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand	D-37
10	VFR1 West Comparison: Runway 30 Closed with Today's Airport and 1983 Demand versus Runway 30 Open with Today's Airport and 1983 Demand	D-43
11	VFR1 West Comparison: All Improvements but Reliever Airport Upgrading, with 1983 Demand versus No Improvements, with 1983 Demand	D-48
12	VFR1 West Comparison: All Improvements, with 1983 Demand versus All Improvements but Reliever Airport Upgrading, with 1983 Demand	D-53
13	VFR2 West Comparison: No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand versus No Improvements, with 1983 Demand	D-58
14	VFR2 West Comparison: All Improvements, with 1983 Demand versus No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand	D-63
15	VFR2 West Comparison: All Improvements but taxiing, with 1983 Demand versus All Improvements, with 1983 Demand	D-68



LIST OF ILLUSTRATIONS  
(Continued)

Figure	Description	Page
16	IFR1 West Comparison: All Improvements but Reliever Airport Upgrading, with 1983 Demand versus No Improvements, with 1983 Demand	D-74
17	IFR1 West Comparison: All Improvements, with 1983 Demand versus All Improvements but Reliever Airport Upgrading, with 1983 Demand	D-79

Attachment A

MIAMI DELAY EXPERIMENTS  
STAGE 1 and STAGE 2

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

**TABLE 1**  
**MIAMI DELAY EXPERIMENTS\***  
**STAGE 1**

Experiment Number	Model	Study Case	Arrival Runways	Departure Runways	Weather	Demand	ATC System Scenario	Near-term Improvements <sup>c</sup>
1	ASM <sup>d</sup>	1	9L, 9R, 12	9L, 9R, 12	VFR1	Today's	Today's	None
7	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983 <sup>l</sup>	Today's	None (Full G. A.)
11	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983 <sup>l</sup>	1983	1983 <sup>e</sup> (Full G. A.)
14	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
4	ASM	4	9L, 9R	9L, 9R, 12	IFR1	Today's	Today's	None
34	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983 <sup>l</sup>	Today's	None (Full G. A.)
9	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983 <sup>m</sup>	1983	g (50% G. A. Reduction)
35	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
6	ASM	8	None	9L	IFR2	Today's	Today's	None
10	ASM	8	None	9L	IFR2	1983 <sup>m</sup>	1983	g (50% G. A. Reduction)
21	ASM	9	9L, 9R	9L, 9R, 12	IFR2	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
2	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	Today's	Today's	None
8	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983 <sup>l</sup>	Today's	None (Full G. A.)
36	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983 <sup>l</sup>	1983	1983 <sup>e</sup> (Full G. A.)
37	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
3	ASM	3	27L, 27R	27L, 27R, 30	VFR2	Today's	Today's	None
38	ASM	3	27L, 27R	27L, 27R, 30	VFR2	1983 <sup>l</sup>	Today's	None (Full G. A.)
17	ASM	3	27L, 27R	27L, 27R, 30	VFR2	1983 <sup>m</sup>	1983	g (50% G. A. Reduction)
12	ASM	7	27R, 30	27L, 27R	VFR2	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
5	ASM	5	27L, 27R	27L, 27R	IFR1	Today's	Today's	None
39	ASM	5	27L, 27R	27L, 27R	IFR1	1983 <sup>l</sup>	Today's	None (Full G. A.)
15	ASM	5	27L, 27R	27L, 27R	IFR1	1983 <sup>l</sup>	1983	1983 <sup>e</sup> (Full G. A.)
20	ASM	5	27L, 27R	27L, 27R	IFR1	1983 <sup>m</sup>	1983	1983 <sup>e, g</sup> (50% G. A. Reduction)
12A	ASM	7	27R, 30	27L, 27R	VFR2	1983 <sup>m</sup>	1983	1983 <sup>P, g</sup> (50% G. A. Reduction)
40	ASM	5	27L, 27R	27L, 27R	VFR1	1983 <sup>l</sup>	Today's	None (Full G. A.)

<sup>a</sup> Study cases are defined in Figure III-1 of the Miami International Airport Technical Plan (Oct. 1978).

<sup>b</sup> FAA will describe impact of pre-1985 and post-1985 ATC systems on model inputs (as per report No. FAA-EM-78-8).

<sup>c</sup> Near-term improvements are described in Appendix B of the Miami International Airport Technical Plan.

<sup>d</sup> Airfield Simulation Model.

<sup>e</sup> Improvement items 1, 2, 3, 7, 9, and 10 as defined by the Miami Delay Studies' Task Force on 3/16/79 are modeled in these experiments.

<sup>f</sup> 50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

<sup>g</sup> Improvement #6 is the use of 2 mile in-trail staggered parallel approaches.

<sup>h</sup> 1983 full schedule assumes no G. A. relocation out of Miami between 1978 and 1983.

<sup>i</sup> 1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

<sup>j</sup> All improvements of footnote "e" except for improvement item #10 (aircraft are being towed instead of taxied in 12A).

<sup>k</sup> Stage 1 experiments as revised by discussions with the Miami Delay Studies' Task Force since 1/24/79

**TABLE 2**  
**MIAMI DELAY EXPERIMENTS\***  
**STAGE 2**

Experiment Number	Model	Study Case	Arrival Runways	Departure Runways	Weather	Demand	ATC System		Near-term Improvements
							Scenario	Improvements	
16	ADM <sup>h</sup>	n.a.	n.a.	n.a.	n.a.	Today's	Today's	None	
29	ADM	n.a.	n.a.	n.a.	n.a.	Pre-1985 <sup>m</sup>	Today's	None	
27	ADM	n.a.	n.a.	n.a.	n.a.	Pre-1985 <sup>m</sup>	Pre-1985	None	
28	ADM	n.a.	n.a.	n.a.	n.a.	Pre-1985 <sup>m</sup>	Today's	Pre-1985 <sup>e, g</sup>	
26	ADM	n.a.	n.a.	n.a.	n.a.	Pre-1985 <sup>m</sup>	Pre-1985	Pre-1985 <sup>e, g</sup>	
33	ADM	n.a.	n.a.	n.a.	n.a.	Post-1985 <sup>q</sup>	Today's	None	
30	ADM	n.a.	n.a.	n.a.	n.a.	Post-1985 <sup>q</sup>	Post-1985	None	
32	ADM	n.a.	n.a.	n.a.	n.a.	Post-1985 <sup>q</sup>	Today's	Post-1985 <sup>r</sup>	
31	ADM	n.a.	n.a.	n.a.	n.a.	Post-1985 <sup>q</sup>	Post-1985	Post-1985 <sup>r</sup>	

<sup>e</sup>Improvement items 1, 2, 3, 7, 9, and 10 as defined by the Miami Delay Studies' Task Force on 3/16/79.

<sup>g</sup>50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

<sup>h</sup>Annual Delay Model

<sup>m</sup>1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

<sup>q</sup>Post-1985 Demand to be provided by the Miami Delay Studies' Task Force.

<sup>r</sup>Post-1985 Improvement Package to be provided by the Miami Delay Studies' Task Force.

\* Stage 2 experiments as revised by discussions with the Miami Delay Studies' Task Force since 1/24/79

Attachment B

1983 AIRPORT IMPROVEMENT SUMMARY

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

This section summarizes the Miami International Airport near-term improvement items as they were applied to various experiments in this report. The improvements were developed by the Miami Delay Studies Task Force from a list originally presented in the 'Miami Interim Report' (Oct. 1977), and have been numbered accordingly as a result.

Figure 1 shows Miami's 1983 physical airfield layout as defined by improvement nos. 1, 3 and 9 below. Figure 2 shows the corresponding link-node diagram used to develop the taxi-way route structures for experiments utilizing the 1983 airfield layout.

The specific application of these improvement items to each experiment is shown in the experimental design summary of Attachment A.

## 1983 Airport Improvements

### Summary

#### Improvement No. 1:

Improve the taxiway system of runway 9L/27R. Install runway centerline lighting and touch down zone lighting on runway 9L. Install dual, 250 foot baseline RVR systems on runway 9L/27R.

#### Improvement No. 2:

Install runway centerline lighting and dual, 250 foot baseline RVR systems on runway 9R/27L.

#### Improvement No. 3:

Install High Intensity Runway Lights, an Instrument Landing System and an Approach Lighting System on runway 30. Provide paved, blast protection shoulders on runways 12/30 and 9R/27L. Implement operational procedures to make greater use of the intersection take-off position on runway 30 and simultaneous use of runways 12 and 9R.

#### Improvement No. 4:

Upgrade Opa Locka and Tamiami General Aviation Reliever Airports, to encourage low performance general aviation aircraft to relocate out of MIA.

#### Improvement No. 6:

Use two-mile, in-trail staggered parallel approaches at MIA, to improve capacity without the extra tower staff required for full, independent parallel approaches.

#### Improvement No. 7:

Install Vortex Advisory System (VAS) monitors at both ends of all three runways at MIA.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

**Improvement No. 9:**

Extend runway 9R/27L by 3650 feet. Relocate the easterly and westerly landing thresholds on runway 9R/27L to positions 2200 feet down the runway, for the purpose of noise abatement. Provide a dual parallel taxiway system and new exit taxiways on runway 9R/27L.

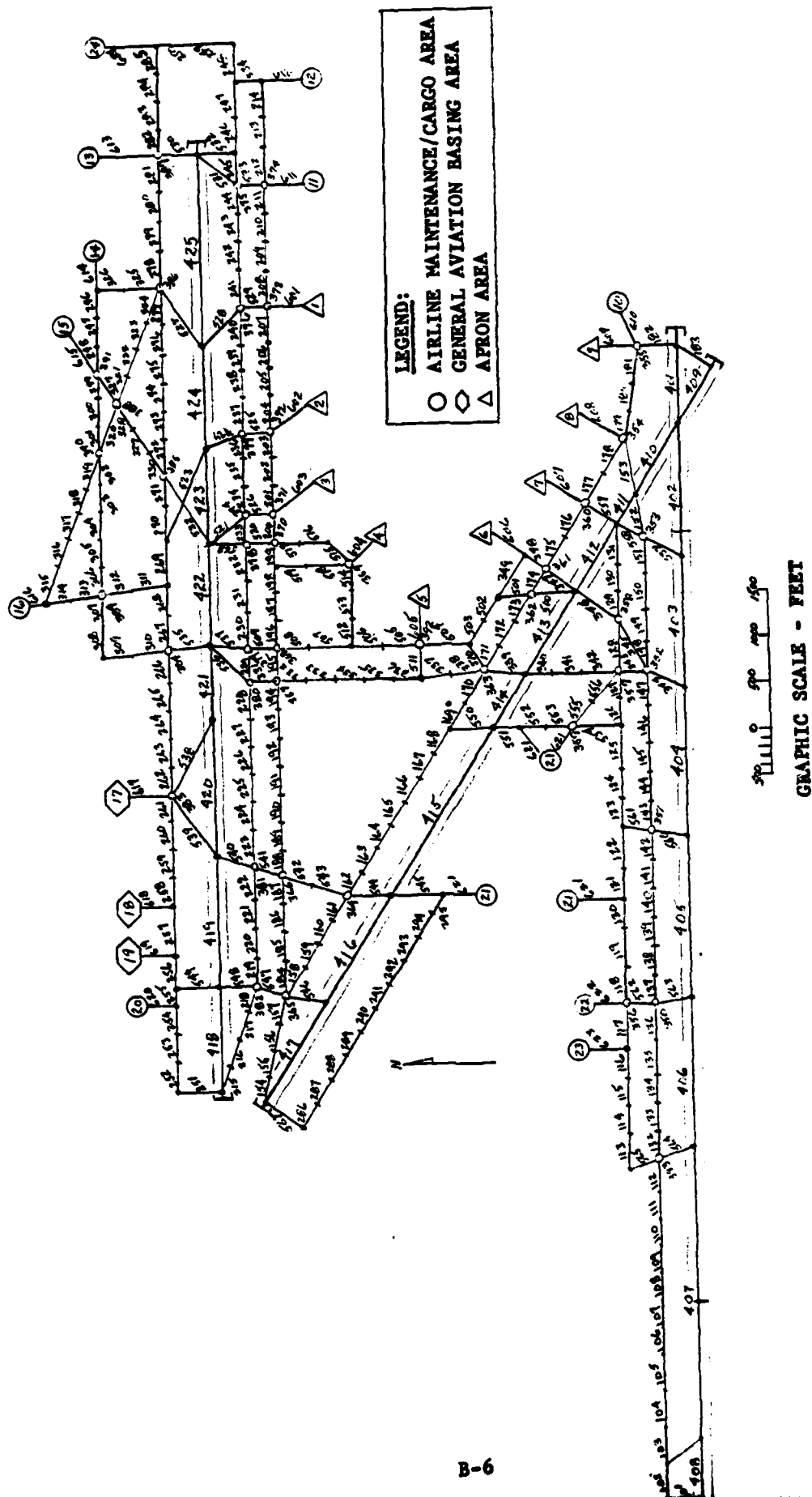
**Improvement No. 10:**

Ask the airlines to taxi, rather than tow their aircraft between their bases and their gates, and vice versa, during peak traffic periods.









Attachment C

CONFIGURATIONS A and B MODEL INPUT DATA  
1983 TIME FRAME

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

This section presents the Airfield Simulation Model input data as applied to those experiments utilizing Miami's 1983 physical airfield improvements and the 1983 ATC system scenario. Variation of the inputs (1) controlled the experiments to reflect the desired conditions of each test.

Primarily, aircraft demand schedules (2) and separations were varied in accordance with the runway configuration, weather and ATC system scenario of each experiment.

The basic Configuration A (easterly) and Configuration B (westerly) model input data for the 1983 improvement experiments follow. Aircraft separations are listed under each configuration for all weather conditions used in the experiments.

-----  
(1) See Attachment B of Miami Data Package No. 5 for model input data as applied to "today's" ATC system scenario and airfield layout.

(2) See Miami Data Package No. 4 for demand schedule summaries.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

Part I

CONFIGURATION A MODEL INPUT DATA  
(1983 TIME FRAME)

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

IN FUTURE DATA

**DEMAND-43**

ROUTE 3-1983 LUNFIS=A

MIAMI INTER. AIRPORT

NUMBER OF RANDOM NUMBER SEEDS

2

RAND IN MONTH SEED					
57651	91921	69011	92157	14577	10493
				27011	40961
					15011
					63661

SYACT TIME 247 F14150 TIME

11 0 20 0

**PRINT OPTIONS**

NUMBER OF AIRLINES  
17

ADAPTING GROUPS									
JA	LA	DL	FF	GG	HH	CI	C2	F1	F2
53	64	11	UT	JT	PT	GA			

### NUMBER OF RUNWAYS

76	71
76	71

RUNWAY (END) LINK NUMBERS		CROSSING LINKS--CLEARANCE TIMES FOR A/C CROSSING ACTIVE RUNWAY	
405	418	ARRIVAL ON R/W DEPARTURE ON R/W	ARRIVAL ON FINAL

549	2	27.	19.	33.	30.	20.	22.	22.	25.	30.	30.
549	2	27.	19.	33.	30.	20.	22.	22.	25.	30.	30.

	2	47.	51.	55.	66.	41.	44.	46.	24.	30.	30.
535	2	47.	51.	55.	66.	41.	44.	46.	24.	30.	30.

[illegible]

ARRIVAL ON R/W DEPARTURE UN R/W ARRIVAL ON FIN

ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FIFTH

LINK QUINCY ARRIVAL IN R/W DEPARTURE UN R/W ARRIVAL IN F

243 3 35. 39. 42. 44. 50. 52. 53. 57. 30. 30. 30. 30.  
KING LINE BUNJAY ARRIVAL ON P/W DEPARTURE ON P/A ARRIVAL ON FIVE

531 46. 40. 35. 04. 40. 43. 46. 53. 30. 30. 30.

340	3	50.	49.	59.	71.	43.	47.	50.	30.	30.
-----	---	-----	-----	-----	-----	-----	-----	-----	-----	-----

500	3	35.	59.	65.	73.	46.	32.	50.	30.	30.	30.
-----	---	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

NO.	NAME	DATE OF DEPARTURE	ON ARRIVAL ON FIVE
197		53-38-05-77	48-52-46-30-30

LINE	LINK	POUNCE	ARRIVAL IN R/W	DEPARTURE	NO. R/S	ARRIVAL ON FIRM
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9
10	10	10	10	10	10	10
11	11	11	11	11	11	11
12	12	12	12	12	12	12
13	13	13	13	13	13	13
14	14	14	14	14	14	14
15	15	15	15	15	15	15
16	16	16	16	16	16	16
17	17	17	17	17	17	17
18	18	18	18	18	18	18
19	19	19	19	19	19	19
20	20	20	20	20	20	20
21	21	21	21	21	21	21
22	22	22	22	22	22	22
23	23	23	23	23	23	23
24	24	24	24	24	24	24
25	25	25	25	25	25	25
26	26	26	26	26	26	26
27	27	27	27	27	27	27
28	28	28	28	28	28	28
29	29	29	29	29	29	29
30	30	30	30	30	30	30
31	31	31	31	31	31	31
32	32	32	32	32	32	32
33	33	33	33	33	33	33
34	34	34	34	34	34	34
35	35	35	35	35	35	35
36	36	36	36	36	36	36
37	37	37	37	37	37	37
38	38	38	38	38	38	38
39	39	39	39	39	39	39
40	40	40	40	40	40	40
41	41	41	41	41	41	41
42	42	42	42	42	42	42
43	43	43	43	43	43	43
44	44	44	44	44	44	44
45	45	45	45	45	45	45
46	46	46	46	46	46	46
47	47	47	47	47	47	47
48	48	48	48	48	48	48
49	49	49	49	49	49	49
50	50	50	50	50	50	50
51	51	51	51	51	51	51
52	52	52	52	52	52	52
53	53	53	53	53	53	53
54	54	54	54	54	54	54
55	55	55	55	55	55	55
56	56	56	56	56	56	56
57	57	57	57	57	57	57
58	58	58	58	58	58	58
59	59	59	59	59	59	59
60	60	60	60	60	60	60
61	61	61	61	61	61	61
62	62	62	62	62	62	62
63	63	63	63	63	63	63
64	64	64	64	64	64	64
65	65	65	65	65</		

**RUNWAY** **WAS** **IN** **A/H** **OFFICE** **ON** **6/4** **ATKIV/L** **IN** **FIL**

ARRIVAL IN -/H DEPARTURE ON R/I ARRIVAL ON FLO

[illegible]

3	66.	69.	71.	71.	52.	57.	62.	73.	30.	30.	30.
---	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

[illegible]

152 3 60. 69. 71. 73. 52. 57. 62. 73. 30. 30. 30. 30.  
 ANG KING RUNWAY ARRIVAL ON S/W DEPARTURE ON S/W ARRIVAL ON FINAL  
 153 3 60. 69. 71. 73. 52. 57. 62. 73. 30. 30. 30. 30.



# KUMAY CROSSING LINKS--OCCUPANCY TIMES (SECS)

CLASS TIME

1 20.00

2 20.00

3 20.00

4 20.00

# RUNWAY CROSSING TIME AND INTERVAL GAP

LINK	DELAY	MEAN	STD DEV
549	1.50	1.00	.50
522	1.50	1.00	.50
536	1.50	1.00	.50
532	1.50	1.00	.50
544	1.50	1.00	.50
545	1.50	1.00	.50
551	1.50	1.00	.50
340	1.50	1.00	.50
500	1.50	1.00	.50
347	1.50	1.00	.50
346	1.50	1.00	.50
131	1.50	1.00	.50
556	1.50	1.00	.50
557	1.50	1.00	.50
152	1.50	1.00	.50
153	1.50	1.00	.50

## NUMBER OF EXITS

13

## DISTANCE IN FEET FROM THRESHOLD TO THE EXIT TAXIWAY (EXIT LINK NO. VERSUS DISTANCE)

540	2640.0	563	3300.0	550	4820.0	537	4920.0	560	5060.0
339	5500.0	521	6000.0	347	6560.0	344	6660.0	524	7060.0
557	7400.0	153	7600.0	559	8080.0				

## NUMBER OF HOLDING AREAS

1

## C-7 HOLDING AREA NUMBERS

99

## NUMBER OF G/A RASING AREAS

6

## G/A RASING AREA NUMBERS

9 16 17 18 19 20

# AIRLINE GATES

IA	4	5	6	17	18	19	20	21	22	23
EA	1	2	3							
DO	3	4								
FF	6	7	21							
GG	5	6	7	8						
HH	7	8	9	10						
CI	3	4	9	17						
C2	6	8	9	17						
F1	17	18	19	20						
F2	14	15	16	16						
F3	21	22	23							
F4	17	18	19	20	21	22	23			
IT	24	2								
UT	2	24								
JT	12	7								
PT	7	12								
GA	0									

## TRUNCATION LIMITS

UPPER LIMIT = 3.00  
LOWER LIMIT = 3.00

DEPARTURE QUEUE LENGTH AND INTERARRIVAL GAP  
QUEUE = 6 MEAN = 2.00 STD DEV = 0.00

## LENGTHS OF COMMON APPROACH PATHS FROM OUTER MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY NO., A/C CLASS, LENGTH)

1	1	7.00
1	2	7.00
1	3	3.00
1	4	3.00
2	1	7.00
2	2	7.00
2	3	3.00
2	4	3.00
3	1	7.00
3	2	7.00
3	3	3.00
3	4	3.00





VECTORED DELAY INPUTS

FIX	DELAY EVALUATION LEVEL	HOLDING PCT.	MAXIMUM VECTORED DELAY	MINIMUM HOLDING DELAY
TAKE-OFF	QUEUE SWITCH FOR RUNWAY	1 = 99	ALTERNATE RUNWAYS ARE	0 0 0 0 0 0
TAKE-OFF	QUEUE SWITCH FOR RUNWAY	2 = 99	ALTERNATE RUNWAYS ARE	0 0 0 0 0 0
TAKE-OFF	QUEUE SWITCH FOR RUNWAY	3 = 99	ALTERNATE RUNWAYS ARE	0 0 0 0 0 0
GATE HOLD LIMIT = 4 HOLD TIME = .50				
GATE HOLD LIMIT = 6 HOLD TIME = .50				
GATE HOLD LIMIT = 3 HOLD TIME = .50				

# AIRSPACE DELAYS

FIX	OCCURRENCE	PERCENTAGE	HOLD MEAN	HOLD SIGMA
A/C DEPARTURE RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)				
1	39.00	4.00		
2	39.00	4.00		
3	34.00	4.00		
4	34.00	4.00		

TROUGH-AND-GO RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)				
1	0.00	0.00		
2	0.00	0.00		
3	0.00	0.00		
4	0.00	0.00		

A/C APPROACH SPEED IN KNOTS (A/C CLASS, MEAN, STD. DEV.)										
CLASS 1										
.001	31.00	.023	34.00	.007	35.50	.159	37.00	.304	38.50	
.001	39.25	.452	34.54	.500	36.00	.548	40.36	.599	43.75	
.002	31.50	.841	43.00	.933	44.50	.977	46.00	1.000	49.00	
CLASS 2										
.001	21.00	.023	44.00	.007	25.50	.159	27.00	.308	28.50	
.001	29.25	.452	29.64	.500	30.00	.548	30.36	.599	30.75	
.002	31.50	.841	33.00	.933	34.50	.977	36.00	1.000	39.00	
CLASS 3										
.001	18.00	.023	16.00	.007	17.00	.159	18.00	.308	19.00	
.001	19.50	.452	19.76	.500	20.00	.548	20.24	.599	20.50	
.002	21.00	.841	22.00	.933	23.00	.977	24.00	1.000	26.00	
CLASS 4										
.001	16.00	.023	16.00	.007	17.00	.159	18.00	.308	19.00	
.001	19.50	.452	19.76	.500	20.00	.548	20.24	.599	20.50	
.002	21.00	.841	22.00	.933	23.00	.977	24.00	1.000	26.00	
A/C APPROACH SPEED IN KNOTS (A/C CLASS, MEAN, STD. DEV.)										
1 140.00 5.00										
2 130.00 5.00										
3 120.00 5.00										
4 100.00 5.00										

RUNWAY EXIT SELECTION--USAGE PERCENTAGE BY CLASS AND CLASS			
CLASS	1 RMY	2 RMY	3 RMY
CLASS 1 RMY	559.	.90	344.
CLASS 2 RMY	559.	1.00	344.
CLASS 3 RMY	559.	1.00	344.
CLASS 4 RMY	559.	.82	559.
CLASS 5 RMY	559.	1.00	559.
CLASS 6 RMY	559.	1.00	559.
CLASS 7 RMY	559.	1.00	559.
CLASS 8 RMY	559.	1.00	559.
CLASS 9 RMY	559.	1.00	559.
CLASS 10 RMY	559.	1.00	559.
CLASS 11 RMY	559.	1.00	559.
CLASS 12 RMY	559.	1.00	559.
CLASS 13 RMY	559.	1.00	559.
CLASS 14 RMY	559.	1.00	559.
CLASS 15 RMY	559.	1.00	559.
CLASS 16 RMY	559.	1.00	559.
CLASS 17 RMY	559.	1.00	559.
CLASS 18 RMY	559.	1.00	559.
CLASS 19 RMY	559.	1.00	559.
CLASS 20 RMY	559.	1.00	559.
CLASS 21 RMY	559.	1.00	559.
CLASS 22 RMY	559.	1.00	559.
CLASS 23 RMY	559.	1.00	559.
CLASS 24 RMY	559.	1.00	559.
CLASS 25 RMY	559.	1.00	559.
CLASS 26 RMY	559.	1.00	559.
CLASS 27 RMY	559.	1.00	559.
CLASS 28 RMY	559.	1.00	559.
CLASS 29 RMY	559.	1.00	559.
CLASS 30 RMY	559.	1.00	559.
CLASS 31 RMY	559.	1.00	559.
CLASS 32 RMY	559.	1.00	559.
CLASS 33 RMY	559.	1.00	559.
CLASS 34 RMY	559.	1.00	559.
CLASS 35 RMY	559.	1.00	559.
CLASS 36 RMY	559.	1.00	559.
CLASS 37 RMY	559.	1.00	559.
CLASS 38 RMY	559.	1.00	559.
CLASS 39 RMY	559.	1.00	559.
CLASS 40 RMY	559.	1.00	559.
CLASS 41 RMY	559.	1.00	559.
CLASS 42 RMY	559.	1.00	559.
CLASS 43 RMY	559.	1.00	559.
CLASS 44 RMY	559.	1.00	559.
CLASS 45 RMY	559.	1.00	559.
CLASS 46 RMY	559.	1.00	559.
CLASS 47 RMY	559.	1.00	559.
CLASS 48 RMY	559.	1.00	559.
CLASS 49 RMY	559.	1.00	559.
CLASS 50 RMY	559.	1.00	559.
CLASS 51 RMY	559.	1.00	559.
CLASS 52 RMY	559.	1.00	559.
CLASS 53 RMY	559.	1.00	559.
CLASS 54 RMY	559.	1.00	559.
CLASS 55 RMY	559.	1.00	559.
CLASS 56 RMY	559.	1.00	559.
CLASS 57 RMY	559.	1.00	559.
CLASS 58 RMY	559.	1.00	559.
CLASS 59 RMY	559.	1.00	559.
CLASS 60 RMY	559.	1.00	559.
CLASS 61 RMY	559.	1.00	559.
CLASS 62 RMY	559.	1.00	559.
CLASS 63 RMY	559.	1.00	559.
CLASS 64 RMY	559.	1.00	559.
CLASS 65 RMY	559.	1.00	559.
CLASS 66 RMY	559.	1.00	559.
CLASS 67 RMY	559.	1.00	559.
CLASS 68 RMY	559.	1.00	559.
CLASS 69 RMY	559.	1.00	559.
CLASS 70 RMY	559.	1.00	559.
CLASS 71 RMY	559.	1.00	559.
CLASS 72 RMY	559.	1.00	559.
CLASS 73 RMY	559.	1.00	559.
CLASS 74 RMY	559.	1.00	559.
CLASS 75 RMY	559.	1.00	559.
CLASS 76 RMY	559.	1.00	559.
CLASS 77 RMY	559.	1.00	559.
CLASS 78 RMY	559.	1.00	559.
CLASS 79 RMY	559.	1.00	559.
CLASS 80 RMY	559.	1.00	559.
CLASS 81 RMY	559.	1.00	559.
CLASS 82 RMY	559.	1.00	559.
CLASS 83 RMY	559.	1.00	559.
CLASS 84 RMY	559.	1.00	559.
CLASS 85 RMY	559.	1.00	559.
CLASS 86 RMY	559.	1	

THE ARRIVAL PURJAY OCCUPANCY TIME IN SECONDARY STAGE									
CLASS 1									
6000.0	45.00	6500.0	48.00	6000.0	52.00	7000.0	48.00	7400.0	55.00
6040.0	71.00								
CLASS 2									
6520.0	35.00	5500.0	45.00	6000.0	55.00	6500.0	54.00	6800.0	59.00
7000.0	48.00	7400.0	64.00	7000.0	74.00	8000.0	62.00		
CLASS 3									
7040.0	35.00	3100.0	40.00	4520.0	49.00	5000.0	51.00	6000.0	53.00

6500.0	69.00	6000.0	63.00	7000.0	54.00	7400.0	60.00	8000.0	72.00
CLASS 4									
2650.0	43.00	3300.0	45.00	5000.0	51.00	6000.0	70.00	6500.0	76.00
7000.0	75.00	7400.0	34.00						



TAXIING SPEEDS IN MPH  
5.00 10.00 15.00 20.00 25.00 30.00 35.00  
A/C LATENCY DISTRIBUTION IN MINUTES (RANDOM NUMBER VERSUS TIME)  
0.00

FIX TRAVEL TIMES		CLASS	FIX TO R/W DIST.	AVERAGE SPEED
FIX	RUNWAY			
1	1	1	34.50	188.20
1	1	2	34.50	180.00
1	2	1	25.50	139.10
1	2	2	25.50	139.10
1	2	3	25.50	160.00
1	2	4	25.50	160.00
1	3	1	18.00	180.00
2	1	1	33.00	198.00
2	1	2	33.00	198.00
2	1	3	33.00	180.00
2	2	1	37.50	204.50
2	2	2	37.50	195.70
2	2	3	37.50	180.00
2	2	4	37.50	180.00
2	3	1	28.50	190.00
2	3	2	28.50	180.00
2	3	3	28.50	180.00
2	3	4	28.50	180.00
2	4	1	27.00	190.00
2	4	2	27.00	160.00
2	4	3	27.00	160.00
2	4	4	27.00	160.00
2	5	1	30.00	225.00
2	5	2	30.00	225.00
2	5	3	30.00	180.00
2	5	4	30.00	180.00
2	6	1	31.50	222.40
2	6	2	31.50	222.40
2	6	3	31.50	160.00
2	6	4	31.50	160.00
2	6	5	31.50	160.00
2	6	6	31.50	160.00
2	6	7	31.50	160.00
2	6	8	31.50	160.00
2	6	9	31.50	160.00
2	6	10	31.50	160.00
2	6	11	31.50	160.00
2	6	12	31.50	160.00
2	6	13	31.50	160.00
2	6	14	31.50	160.00
2	6	15	31.50	160.00
2	6	16	31.50	160.00
2	6	17	31.50	160.00
2	6	18	31.50	160.00
2	6	19	31.50	160.00
2	6	20	31.50	160.00
2	6	21	31.50	160.00
2	6	22	31.50	160.00
2	6	23	31.50	160.00
2	6	24	31.50	160.00
2	6	25	31.50	160.00
2	6	26	31.50	160.00
2	6	27	31.50	160.00
2	6	28	31.50	160.00
2	6	29	31.50	160.00
2	6	30	31.50	160.00
2	6	31	31.50	160.00
2	6	32	31.50	160.00
2	6	33	31.50	160.00
2	6	34	31.50	160.00
2	6	35	31.50	160.00
2	6	36	31.50	160.00
2	6	37	31.50	160.00
2	6	38	31.50	160.00
2	6	39	31.50	160.00
2	6	40	31.50	160.00
2	6	41	31.50	160.00
2	6	42	31.50	160.00
2	6	43	31.50	160.00
2	6	44	31.50	160.00
2	6	45	31.50	160.00
2	6	46	31.50	160.00
2	6	47	31.50	160.00
2	6	48	31.50	160.00
2	6	49	31.50	160.00
2	6	50	31.50	160.00
2	6	51	31.50	160.00
2	6	52	31.50	160.00
2	6	53	31.50	160.00
2	6	54	31.50	160.00
2	6	55	31.50	160.00
2	6	56	31.50	160.00
2	6	57	31.50	160.00
2	6	58	31.50	160.00
2	6	59	31.50	160.00
2	6	60	31.50	160.00
2	6	61	31.50	160.00
2	6	62	31.50	160.00
2	6	63	31.50	160.00
2	6	64	31.50	160.00
2	6	65	31.50	160.00
2	6	66	31.50	160.00
2	6	67	31.50	160.00
2	6	68	31.50	160.00
2	6	69	31.50	160.00
2	6	70	31.50	160.00
2	6	71	31.50	160.00
2	6	72	31.50	160.00
2	6	73	31.50	160.00
2	6	74	31.50	160.00
2	6	75	31.50	160.00
2	6	76	31.50	160.00
2	6	77	31.50	160.00
2	6	78	31.50	160.00
2	6	79	31.50	160.00
2	6	80	31.50	160.00
2	6	81	31.50	160.00
2	6	82	31.50	160.00
2	6	83	31.50	160.00
2	6	84	31.50	160.00
2	6	85	31.50	160.00
2	6	86	31.50	160.00
2	6	87	31.50	160.00
2	6	88	31.50	160.00
2	6	89	31.50	160.00
2	6	90	31.50	160.00
2	6	91	31.50	160.00
2	6	92	31.50	160.00
2	6	93	31.50	160.00
2	6	94	31.50	160.00
2	6	95	31.50	160.00
2	6	96	31.50	160.00
2	6	97	31.50	160.00
2	6	98	31.50	160.00
2	6	99	31.50	160.00
2	6	100	31.50	160.00

180.00  
180.00  
180.00  
180.00  
180.00

.01  
.01  
.01  
.01  
.01

4  
1  
2  
3  
4

3  
3  
3  
3  
3

10  
10  
10  
10  
10

A/C SEPARATIONS  
 120 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE  
 EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION  
 THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS A FOLLOWED BY A/C CLASS Y  
 THERE ARE 4 A/C CLASSES -- 1 J C CLASS  
 2 J C CLASS  
 3 J C CLASS  
 4 J A CLASS

THE ORDER OF SETS OF (X,Y) IS 1

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)  
 (3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0  
 120 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

3.70	.43	1.93	.40	4.86	.37	4.72	.31
2.90	.43	2.83	.40	3.56	.37	3.42	.31
2.90	.43	2.83	.40	2.76	.37	2.62	.31
2.90	.43	2.83	.40	2.76	.37	2.62	.31
1.69	.14	1.57	.13	1.44	.12	1.20	.11
1.69	.14	1.57	.13	1.44	.12	1.20	.11
1.47	.14	1.37	.13	1.25	.12	1.04	.11
1.47	.14	1.37	.13	1.25	.12	1.04	.11
1.50	.03	2.00	.08	2.60	.03	2.00	.08
1.00	.03	1.06	.06	.83	.04	.83	.08
.83	.08	.75	.03	.58	.08	.58	.08
.83	.06	.75	.06	.58	.08	.58	.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C-17

LEAD A/C RUNWAY 1 LEAD A/C FIX 0 TRAIL A/C RUNWAY 3 TRAIL A/C FIX 0  
 120 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.69	.14	1.57	.13	1.44	.12	1.20	.11
1.69	.14	0.00	0.00	0.00	0.00	0.00	0.00
1.47	.14	0.00	0.00	0.00	0.00	0.00	0.00
1.47	.14	0.00	0.00	0.00	0.00	0.00	0.00
1.50	.03	2.00	.08	2.60	.03	2.00	.08
1.00	.03	1.06	.06	.83	.04	.83	.08
.83	.08	.75	.03	.58	.08	.58	.08
.83	.06	.75	.06	.58	.08	.58	.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 3  
 AIRCRAFT SEPARATIONS  
 1983 VFR1, EASTERLY CONFIGURATION

LEAD A/C PUNWAY 3	LEAD A/C FIX 0	TRAIL A/C PUNWAY 1	TRAIL A/C FIX 0
120 SEPARATION VALUES IN 4 SETS OF 30 A/A (IN MILES), U/A (IN MILES), D/D (MINUTES) AND A/D (MINUTES)			
3.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00
0.03	0.00	0.00	0.00
0.09	0.00	0.00	0.00
1.69	1.57	1.44	1.20
1.63	1.14	0.00	0.00
1.47	0.00	0.00	0.00
1.47	0.00	0.00	0.00
1.50	0.04	2.03	0.08
1.00	0.04	1.00	0.04
.83	0.04	0.75	0.08
.83	0.04	0.75	0.08
.96	0.13	0.96	0.13
.87	0.13	0.00	0.00
.90	0.13	0.00	0.00
1.03	0.13	0.00	0.00

[illegible][illegible]

A/C SEPARATIONS  
 128 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE  
 EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION  
 THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y  
 THERE ARE 4 A/C CLASSES -- 1 J D CLASS  
 2 J C CLASS  
 3 J B CLASS  
 4 J A CLASS

THE ORDER OF SETS OF (X,Y) IS

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)  
 (3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0  
 128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

4.00	.43	3.93	.40	4.86	.37	4.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
1.50	.08	2.00	.04	2.00	.08	2.00	.08
1.00	.03	1.00	.08	.83	.08	.83	.08
.83	.04	.75	.08	.58	.08	.58	.08
.83	.04	.75	.08	.58	.08	.58	.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

C-19

LEAD A/C RUNWAY 1 LEAD A/C FIX 0 TRAIL A/C RUNWAY 3 TRAIL A/C FIX 0  
 128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

4.00	.43	3.93	.40	4.86	.37	4.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
1.50	.08	2.00	.08	2.00	.08	2.00	.08
1.00	.03	1.00	.08	.83	.08	.83	.08
.83	.04	.75	.08	.58	.08	.58	.08
.83	.04	.75	.08	.58	.08	.58	.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 4

AIRCRAFT SEPARATIONS  
 1983 IFRL, EASTERLY CONFIGURATION

LEAD A/C RUNWAY 3	LEAD A/C FIX 0	TRAIL A/C RUNWAY 1	TRAIL A/C FIX 0
128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N-MILES), D/A (N-MILES), D/D (MINUTES) AND A/D (MINUTES)			
4.00	.43	3.93	.40
4.00	.43	3.93	.40
4.00	.43	3.93	.40
4.00	.43	3.93	.40
2.24	.14	2.22	.11
2.24	.14	2.22	.11
2.22	.14	2.22	.11
2.22	.14	2.22	.11
1.50	.04	2.00	.04
1.00	.03	1.00	.03
.83	.08	.75	.08
.83	.08	.75	.08
.90	.13	.96	.13
.97	.13	.97	.13
.90	.13	.90	.13
1.03	.13	1.03	.13

[illegible][illegible]

**TABLE 4**  
**(continued)**

# A/C SEPARATIONS

128 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE

EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION

THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y

THERE ARE 4 A/C CLASSES -- 1 D CLASS

2 I C CLASS

3 I B CLASS

4 I A CLASS

THE ORDER OF SETS OF (X,Y) IS 1

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)

(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0

128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

4.00 .43 3.93 .40 3.86 .37 3.72 .31

4.00 .43 3.93 .40 3.86 .37 3.72 .31

4.00 .43 3.93 .40 3.86 .37 3.72 .31

4.00 .43 3.93 .40 3.86 .37 3.72 .31

2.24 .14 2.22 .13 2.22 .12 2.22 .11

2.24 .14 2.22 .13 2.22 .12 2.22 .11

2.22 .14 2.22 .13 2.22 .12 2.22 .11

2.22 .14 2.22 .13 2.22 .12 2.22 .11

1.50 .08 2.00 .08 2.00 .08 2.00 .08

1.00 .08 1.00 .08 .83 .08 .83 .08

.83 .08 .75 .08 .58 .08 .58 .08

.83 .08 .75 .08 .58 .08 .58 .08

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

TABLE 5

AIRCRAFT SEPARATIONS  
1983 IFR2, EASTERLY CONFIGURATION



LEAD A/C RUN-WAY	3	LEAD A/C FIX 0	TRAIL A/C RUNWAY 1	TRAIL A/C FIX 0
120 SEPARATION VALUES	IN 4 SETS OF 32, A/A (N-MILES), D/A (N-MILES), D/D (MINUTES) AND A/D (MINUTES)			
4.00	.43	3.93	.40	4.86
4.00	.43	3.93	.40	3.86
4.00	.43	3.93	.40	3.72
4.00	.43	3.93	.40	3.86
4.00	.43	3.93	.40	3.72
2.24	.14	2.22	.13	2.22
2.24	.14	2.22	.13	2.22
2.22	.14	2.22	.13	2.22
2.22	.14	2.22	.13	2.22
1.50	.09	2.00	.08	2.00
1.00	.08	1.00	.08	.83
.83	.04	.75	.08	.58
.93	.09	.75	.08	.58
1.04	.13	1.04	.13	1.04
.96	.13	.96	.13	.96
.98	.13	.98	.13	.98
1.12	.13	1.12	.13	1.12

[illegible][illegible]

Note that the arrival runway occupancy times for IFR2 conditions are set 5 seconds greater than for IFR1.  
The adjusted IFR2 runway clearance times and occupancy times are as follows:

RWY XING LINKS													
RWY XING LINKS MIA CONFIGURATION A IFR2 1983													
2	549	32	43	38	35	20	22	22	25	30	30	30	30
2	535	52	56	60	71	41	44	46	54	30	30	30	30
2	536	52	56	60	71	41	44	46	54	30	30	30	30
2	532	58	58	74	85	63	70	78	93	30	30	30	30
3	544	38	41	47	49	30	32	33	37	30	30	30	30
3	545	38	41	47	49	30	32	33	37	30	30	30	30
3	551	51	45	60	69	40	43	46	53	30	30	30	30
3	340	55	54	64	76	43	47	50	58	30	30	30	30
3	500	60	64	70	78	48	52	56	66	30	30	30	30
3	347	60	64	70	78	48	52	56	66	30	30	30	30
3	346	60	64	70	78	48	52	56	66	30	30	30	30
3	131	65	74	76	78	52	57	62	73	30	30	30	30
3	558	65	74	76	78	52	57	62	73	30	30	30	30
3	557	65	74	76	78	52	57	62	73	30	30	30	30
3	152	65	74	76	78	52	57	62	73	30	30	30	30
-3	153	65	74	76	78	52	57	62	73	30	30	30	30
RWY ARRIVAL OCCUPANCY TIMES CONFIGURATION A IFR2 1983													
1	6000	50	6560	53	6660	67	7060	53	7400	60			
8080	76												
2	4820	40	5500	49	6000	50	6560	59	6660	64			
7060	53	7400	69	7800	69	8080	8080	72					
3	10												
2640	40	3300	45	4920	54	5060	56	6000	6000	58			
6560	65	6660	68	7060	69	7400	7400	71	8080	77			
-4	7												
2640	48	3300	50	5060	66	6000	6000	75	6560	81			
7060	80	7400	89										

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

Part II

CONFIGURATION B MODEL INPUT DATA  
(1983 TIME FRAME)

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980



RUNWAY CROSSING LINKS--OCCUPANCY TIR. 5 (BLOS)

CLASS	TIME
1	20.00
2	20.00
3	20.00
4	20.00

# RUNWAY CROSSING TIME AND INTERARRIVAL GAP

LINK	DELAY	MEAN	STD DEV
249	1.50	1.00	.50
250	1.50	1.00	.50
535	1.50	1.00	.50
537	1.50	1.00	.50
543	1.50	1.00	.50
549	1.50	1.00	.50
182	1.50	1.00	.50
131	1.50	1.00	.50
346	1.50	1.00	.50
339	1.50	1.00	.50
544	1.50	1.00	.50
545	1.50	1.00	.50

NUMBER OF EXITS  
11

## DISTANCE IN FEET FROM THRESHOLD TO THE EXIT TAXIWAY (EXIT LINK NO. VERSUS DISTANCE)

500	2990.0	560	3300.0	339	3990.0	568	4340.0	550	4620.0
563	5040.0	536	5480.0	564	6680.0	544	6780.0	540	7780.0
546	8120.0								

NUMBER OF HOLDING AREAS  
1

## HOLDING AREA NUMBERS

99

NUMBER OF G/A PAVING AREAS  
6

## G/A PAVING AREA NUMBERS

9 16 17 18 19 20

# AIRLINE GATES

1A	2	3	4	5	6	7	8	9	10	11	12	13
EA	1	2	3									
DD	3	4										
FF	6	7	21									
GG	5	6	7	8								
MH	7	3	9	10								
CI	3	4	9	17								
C2	6	8	9	17								
F1	17	18	19	20								
F2	14	15	16	18								
F3	21	22	23									
F4	17	18	19	20	21	22	23					
IT	24	2										
UT	2	24										
GT	12	7										
PT	7	12										
GA	0											

## TRUNCATION LIMITS

UPPER LIMIT = 3.00  
LOWER LIMIT = 3.00

DEPARTURE QUEUE LENGTH AND INTERARRIVAL GAP  
QUEUE = 4 MEAN = 2.00 STD DEV = 0.00

## LENGTHS OF COMMON APPROACH PATHS FROM QUEEN MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY NO., A/C CLASS, LENGTH)

1	1	7.00
1	2	7.00
1	3	3.00
1	4	3.00
2	1	7.00
2	2	7.00
2	3	3.00
2	4	3.00
3	1	7.00
3	2	7.00
3	3	3.00
3	4	3.00



LINKS 2	156	117
LINKS 2	117	356
LINKS 2	511	392
LINKS 2	392	511
LINKS 2	535	535
LINKS 2	257	256
LINKS 3	366	325
LINKS 3	388	327
LINKS 3	389	313
LINKS 3	326	386
LINKS 3	391	327
LINKS 3	372	525
LINKS 3	250	249
LINKS 3	314	313
LINKS 3	248	250
LINKS 3	377	525
LINKS 4	357	556
LINKS 4	359	555
LINKS 4	360	176
LINKS 5	544	364
LINKS 5	258	259
LINKS 5	354	179
LINKS 6	369	542
LINKS 6	544	364
LINKS 6	545	544
LINKS 6	257	258
LINKS 7	384	267
LINKS 7	385	271
LINKS 7	256	257
LINKS 7	158	159

**C-30**

LINKS 7	179	177	310	176	175	361
354						
LINKS 8	384	267	266	264	270	271 385
355						
LINKS 9	261	260	259	258	257	256 255
383						
LINKS 10	256	257	258	259	260	261 383
255						
LINKS 11	177	178	354	179	180	181 355 609
360						
LINKS 12	177	178	354	179	180	181 355 610
360						
LINKS 13	175	176	360	177	179	354 179 180 181
361						
LINKS 14	175	176	360	177	178	354 179 180 181
355						
LINKS 15	175	176	360	177	178	354 179 180 181
361						
LINKS 16	175	176	360	177	178	354 179 180 181
361						
LINKS 17	175	176	360	177	178	354 179 180 181
361						
LINKS 18	175	176	360	177	178	354 179 180 181
361						
LINKS 19	175	176	360	177	178	354 179 180 181
361						
LINKS 20	175	176	360	177	178	354 179 180 181
361						

VECTING DELAY INPUTS  
 FIX RELAY EVALUATION LEVEL HOLDING PCT. MAXIMUM VECTING DELAY MINIMUM HOLDING DELAY

TAKE-OFF QUEUE SWITCH FOR RUNWAY 1 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 2 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 3 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

GATE HOLD LIMIT = 6 HOLD TIME = .50

GATE HOLD LIMIT = 6 HOLD TIME = .50

GATE HOLD LIMIT = 6 HOLD TIME = .50

AIRSPACE DELAYS

FIX OCCURRENCE PERCENTAGE HOLD MEAN HOLD SIGMA

A/C DEPARTURE RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

1	39.00	4.00
2	39.00	4.00
3	34.00	4.00
4	34.00	4.00

TOUCH-AND-GO RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

1	0.00	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00

# GATE SERVICE TIME DISTRIBUTION (PROBABILITY VS TIME)

CLASS 1									
.001	31.00	.023	34.00	.007	35.50	.159	37.00	.308	38.50
.001	39.25	.552	37.64	.500	40.00	.548	40.36	.599	40.75
.692	41.50	.841	43.00	.933	44.50	.977	46.00	1.000	47.00
CLASS 2									
.001	21.00	.023	24.00	.067	25.50	.159	27.00	.308	28.50
.001	29.25	.552	29.64	.500	30.00	.548	30.36	.599	30.75
.692	31.50	.841	33.00	.933	34.50	.977	36.00	1.000	39.00
CLASS 3									
.001	14.00	.023	16.00	.067	17.00	.159	18.00	.308	19.00
.001	19.50	.552	19.76	.500	20.00	.548	20.24	.599	20.50
.692	21.00	.841	22.00	.933	23.00	.977	24.00	1.000	26.00
CLASS 4									
.001	14.00	.023	16.00	.067	17.00	.159	18.00	.308	19.00
.001	19.50	.552	19.76	.500	20.00	.548	20.24	.599	20.50
.692	21.00	.841	22.00	.933	23.00	.977	24.00	1.000	26.00

## A/C APPROACH SPEED IN KNOTS (A/C CLASS, MEAN, STD. DEV.)

1	140.00	5.00
2	130.00	5.00
3	120.00	5.00
4	100.00	5.00

## RUNWAY EXIT SELECTION--USAGE PERCENTAGE BY EACH A/C CLASS AND BY EACH RUNWAY (EXIT LINK NO. VERSUS PROBABILITY)

CLASS 1 PMY 1									
540.	.90	536.	1.00						
CLASS 2 PMY 1									
536.	.90	540.	1.00						
CLASS 3 PMY 1									
569.	.63	540.	.87	536.	1.00				
CLASS 4 PMY 1									
568.	.50	540.	1.00						
CLASS 1 PMY 2									
564.	.90	563.	1.00						
CLASS 2 PMY 2									
563.	.90	564.	1.00						
CLASS 3 PMY 2									
560.	.60	563.	1.00						
CLASS 4 PMY 2									
560.	.60	563.	1.00						
CLASS 1 PMY 3									
544.	.87	546.	1.00						
CLASS 2 PMY 3									
544.	.83	550.	.92	500.	.97	339.	1.00		
CLASS 3 PMY 3									
546.	.43	509.	.70	544.	.90	550.	1.00		
CLASS 4 PMY 3									
546.	.40	500.	.70	544.	.90	550.	1.00		

## THE SURVIVAL RUNWAY OCCUPANCY TIME IN SECONDS BY A/C CLASS (DISTANCE IN FEET FROM THRESHOLD TO EXIT TAXIWAY VERSUS TIME)

CLASS 1									
5040.0	52.00	5400.0	41.00	6680.0	62.00	6700.0	58.00	7780.0	61.00
9120.0	70.00								
CLASS 2									
2890.0	37.00	3920.0	43.00	4620.0	47.00	5040.0	44.00	5400.0	47.00
CLASS 3									
6050.0	51.00	6780.0	53.00	7780.0	57.00				
CLASS 4									
2890.0	39.00	3300.0	40.00	4340.0	47.00	4620.0	50.00	5040.0	51.00
5400.0	54.00	6780.0	64.00	7700.0	69.00	8120.0	73.00		

CLASS 4	41.00	1100.0	45.00	4340.0	50.00	4620.0	57.00	5040.0	61.00
2890.0	74.00	1100.0	27.00	8120.0	90.00				
6700.0									

TAXIING SPEEDS IN MPH

5.00	10.00	15.00	20.00	25.00	30.00	35.00
------	-------	-------	-------	-------	-------	-------

A/C LATENCY DISTRIBUTION IN MINUTES (RANDOM NUMBER VERSUS TIME)

0.00						
------	--	--	--	--	--	--

FIX TRAVEL TIMES			CLASS	FIA TO N/M DIST.	AVERAGE SPEED
FIX	RUNWAY				
1	1	1	1	28.50	180.00
1	1	1	2	28.50	180.00
1	1	1	3	28.50	180.00
1	2	2	2	28.50	180.00
2	1	1	2	25.50	186.00
2	2	2	1	28.50	180.00
2	2	2	2	28.50	180.00
2	3	3	1	27.00	202.50
2	3	3	2	27.00	202.50
2	3	3	3	27.00	180.00
3	1	1	1	28.50	180.00
3	2	2	2	42.00	180.00
3	3	3	1	31.50	198.90
3	3	3	2	31.50	180.00
4	1	1	1	30.00	180.00
4	1	1	2	30.00	180.00
4	2	2	1	31.50	180.00
4	3	3	1	28.50	180.00
4	3	3	2	28.50	180.00

# A/C SEPARATIONS

124 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / DEPARTURE / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE

EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION

THE 16 SETS ARE POSSIBLE MAY, IF A/C CLASS A FOLLOWED BY A/C CLASS Y

THERE ARE 4 A/C CLASSES -- 1 1 D CLASS

2 1 C CLASS

3 1 B CLASS

4 1 A CLASS

THE ORDER OF SETS OF (4,4) IS 1

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)

(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0  
128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

3.70 .43 3.93 .40 4.86 .37 4.72 .31

2.90 .43 2.43 .40 3.56 .37 3.42 .31

2.90 .43 2.83 .40 2.76 .37 2.62 .31

2.90 .43 2.83 .40 2.76 .37 2.62 .31

1.69 .14 1.57 .13 1.44 .12 1.20 .11

1.69 .14 1.57 .13 1.44 .12 1.20 .11

1.47 .14 1.37 .13 1.25 .12 1.04 .11

1.47 .14 1.37 .13 1.25 .12 1.04 .11

1.50 .04 2.00 .08 2.00 .08 2.00 .08

1.00 .03 1.00 .08 .93 .09 .83 .08

.83 .08 .75 .05 .58 .04 .58 .08

.83 .08 .75 .05 .58 .04 .58 .08

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

LEAD A/C RUNWAY 1 LEAD A/C FIX 0 TRAIL A/C RUNWAY 3 TRAIL A/C FIX 0

128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

1.50 .04 2.00 .08 2.00 .08 2.00 .08

1.00 .03 1.00 .08 .93 .09 .83 .08

.83 .08 .75 .05 .58 .04 .58 .08

.83 .08 .75 .05 .58 .04 .58 .08

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

TABLE 6

AIRCRAFT SEPARATIONS  
1983 VFR1, WESTERLY CONFIGURATION



[illegible]

LEAD A/C RUNWAY	2	LEAD A/C FIX	0	TRAIL A/C RUNWAY	3	TRAIL A/C FIX	0
128 SEPARATION VALUES IN 4 SECS OF 32.5 A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)							
3.70	.43	3.93	.40	4.06	.37	4.72	.31
2.90	.43	2.83	.40	3.50	.37	3.42	.31
2.90	.43	.3	.40	2.76	.37	2.62	.31
2.90	.43		.40	2.76	.37	2.62	.31
.91	.14		.13	.78	.12	.65	.11
.91	.14		.13	.73	.12	.65	.11
.79	.14		.13	.68	.12	.56	.11
.79	.14		.13	.63	.12	.56	.11
.50	.09	.08	.08	.60	.09	.66	.08
.33	.08	.33	.03	.27	.08	.27	.08
.27	.09	.25	.08	.19	.08	.14	.08
.27	.03	.25	.08	.19	.08	.19	.08
.32	.13	.32	.13	.32	.13	.32	.13
.29	.13	.29	.13	.29	.13	.29	.13
.30	.13	.30	.13	.30	.13	.30	.13
.34	.13	.34	.13	.34	.13	.34	.13

LEAD A/C RUNWAY	3	LEAD A/C FIX 0	TRAIL A/C RUNWAY 2	TRAIL A/C FIX 0
120 SEPARATION VALUES IN 4 SETS OF 32, A/A (IN-MILES), D/A (IN-MILES), O/D (MINUTES) AND A/D (MINUTES)				
3.70	.41	3.93	.40	4.06
			.37	4.72
2.90	.43	2.83	.40	3.56
			.37	3.42
2.90	.43	2.83	.40	2.76
			.37	2.62
2.90	.43	2.83	.40	2.76
			.37	2.62
.91	.14	.95	.13	.78
			.12	.65
.91	.14	.85	.13	.78
			.12	.65
.79	.14	.74	.13	.60
			.12	.56
.79	.14	.74	.13	.68
			.12	.56
.50	.08	.66	.08	.66
			.08	.08
.31	.04	.33	.04	.27
			.06	.27
.27	.08	.25	.08	.19
			.08	.08
.27	.04	.25	.04	.19
			.06	.14
.32	.13	.32	.13	.32
			.13	.32
.29	.13	.29	.13	.29
			.13	.29
.30	.13	.30	.13	.30
			.13	.30
.34	.13	.34	.13	.34
			.13	.34



[illegible]

LEAD A/C RUNWAY 2		LEAD A/C FIX 0		TRAIL A/C RUNWAY 3		TRAIL A/C FIX 0	
128 SEPARATION VALUES IN 4 SETS OF 32, A/A (MILES), D/D (MINUTES), D/D (MINUTES) AND A/D (MINUTES)							
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.41	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
4.00	.43	3.93	.40	3.86	.37	3.72	.31
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.24	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
2.22	.14	2.22	.13	2.22	.12	2.22	.11
5.0	.08	.66	.08	.66	.08	.66	.08
.33	.09	.33	.06	.27	.03	.27	.08
.27	.09	.25	.09	.19	.09	.19	.06
.27	.08	.25	.08	.19	.09	.19	.06
.32	.13	.32	.13	.32	.13	.32	.13
.29	.13	.29	.13	.29	.13	.29	.13
.30	.13	.30	.13	.30	.13	.30	.13
.34	.13	.34	.13	.34	.13	.34	.13

LEAD A/C RUNWAY	5	LEAD A/C FIX	0	TRAIL A/C RUNWAY	2	TRAIL A/C FIX	0
128 SEPARATION VALUES IN 4 SETS OF 32	A/A (N.MILES)	D/D (MINUTES)	A/D (MINUTES)				
4.00	4.93	.40	4.96	.37	4.72	.31	
4.00	3.93	.40	3.86	.37	3.72	.31	
4.00	3.93	.40	3.86	.37	3.72	.31	
4.00	3.93	.40	3.86	.37	3.72	.31	
2.24	2.22	.13	2.22	.12	2.22	.11	
2.24	2.22	.13	2.22	.12	2.22	.11	
2.24	2.22	.13	2.22	.12	2.22	.11	
2.24	2.22	.13	2.22	.12	2.22	.11	
5.0	.66	.08	.66	.08	.66	.08	
.33	.33	.06	.27	.08	.27	.06	
.27	.25	.03	.19	.03	.19	.03	
.27	.25	.06	.19	.03	.19	.08	
.32	.32	.13	.32	.13	.32	.13	
.29	.29	.13	.29	.13	.29	.13	
.30	.30	.13	.30	.13	.30	.13	
.34	.34	.13	.34	.13	.34	.13	

**TABLE 7**  
**(continued)**

Attachment D

EXPERIMENTAL RESULTS  
MIAMI STAGE 1 DELAY EXPERIMENTS

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

This section presents the results of all Miami Stage 1 experiments that were not previously included in Miami Data Package No. 5. These results include new experiment Nos. 40, 11A, 35M1, 35M2 and 21M, as well as a re-run of Experiment No. 6 for which preliminary results were shown in Data Package No. 5.

Experiment No. 40 was added at the request of the Delay Studies Task Force. Experiment No. 11A (Reliever upgrading without airfield physical improvements) was added to contrast against Experiment No. 11 (Airfield physical improvements without Reliever upgrading), once the high significance of Reliever upgrading was observed. Experiments 35M1 and 21M were added to demonstrate the effect of the displaced landing threshold location on runway 9R, which was found to be very significant in the 1983 IFR situation. Experiment 35M2 was added to examine an alternate solution to the displaced landing threshold location problem, by showing the effect of increasing the inter-arrival gap to allow departures to be released.

The results are arranged in sets to illustrate various comparisons requested by Task Force members. VFR and IFR weather conditions have been separated along with each configuration:

Set 1: VFR EAST- Exp. Nos. 11, 11A and 14.

Set 2: IFR EAST- Exp. Nos. 9, 35, 35M1, 35M2, 6, 10, 21 and 21M.

Set 3: VFR WEST- Exp. Nos. 40, 36, 37, 17, 12 and 12A.

Set 4: IFR WEST- Exp. Nos. 15 and 20.

Each experiment's summary contains a description of the objective, the runway configuration, the related comparison experiments and a table of results. Plots are also included which illustrate key comparisons between experiments.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 8

SET 1 DEMAND  
VFR, EASTERLY FLOW

EXPERIMENT NUMBER		RUNWAY 9R	RUNWAY 9L	RUNWAY 12	TOTAL
11  (7)	ARRIVALS	196	194	5	395
	DEPARTURES	130	200	40	370
	TOTAL	326	394	45	765
14	ARRIVALS	188	161	5	354
	DEPARTURES	131	161	37	329
	TOTAL	319	322	42	683
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				

## EXPERIMENT NO. 11

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami near-term improvements except for Reliever Airport upgrading:

#### Arrival Runways

9L,9R,12

#### Departure Runways

9L,9R,12

### Related Comparison Experiments:

Prior experiment 7 (Data Package No. 5) serves as the 1983 demand level baseline for comparison to this experiment. Experiment 14 assesses the expected delays after reducing the G.A. traffic of this study case by 50-percent.

VFR1- Ceiling above 1500 ft. and visibility over 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 9

## EXPERIMENT 11 RESULTS

MIAMI INTER. AIRPORT EXPER.-11 ROUTES-1983 CONFIG-A SEPAR-83VFR1 DEMAND-83

## AVERAGE FLOW RATES

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE TRAVEL TIMES TO		
	RWY 9L	RWY 12	RWY 9L	RWY 9L	RWY 12	RWY 12		FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.4	22.0	0.0	0.0	0.0	0.0	-8.6	11.89	2.69	5.06
1200-1300	32.6	29.3	1.0	0.0	0.0	0.0	-5.7	16.23	2.79	15.07
1300-1400	20.5	28.5	0.0	0.0	0.0	0.0	-7.7	20.64	3.06	18.61
1400-1500	23.6	25.2	1.0	0.0	0.0	0.0	-1.9	14.97	2.93	19.34
1500-1600	31.8	26.8	1.0	0.0	0.0	0.0	-12.3	12.38	2.79	10.69
1600-1700	26.1	23.2	2.0	0.0	0.0	0.0	-0.0	14.22	2.81	12.38
1700-1800	21.0	21.1	0.0	0.0	0.0	0.0	-1.9	11.28	2.98	11.30
1800-1900	16.0	16.7	0.0	0.0	0.0	0.0	-1.2	10.10	2.60	10.07
1900-2000	0.0	1.2	0.0	0.0	0.0	0.0	-0.0	12.95	3.20	6.35
AVERAGE DELAYS								GRAND TOTAL		
								ARR	DEP	

## AVERAGE DELAYS

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE TRAVEL TIMES TO		
	RWY 9L	RWY 12	RWY 9L	RWY 9L	RWY 12	RWY 12		FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	3.3	.9	0.0	0.0	0.0	0.0	-0.0	2.2	1.5	
1200-1300	9.1	4.0	1.1	0.0	0.0	0.0	.0	6.6	11.0	
1300-1400	1.1	17.8	0.0	0.0	0.0	0.0	.0	10.8	14.6	
1400-1500	1.4	8.9	.7	0.0	0.0	0.0	.0	5.2	15.5	
1500-1600	2.5	2.9	0.0	0.0	0.0	0.0	.0	2.7	6.9	
1600-1700	5.7	4.0	.1	0.0	0.0	0.0	.0	4.7	8.3	
1700-1800	3.0	.8	0.0	0.0	0.0	0.0	.0	1.9	7.5	
1800-1900	.3	.7	0.0	0.0	0.0	0.0	.0	.5	6.0	
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	.0	2.0	1.4	
AVERAGE DELAYS								GRAND TOTAL		
								ARR	DEP	



## EXPERIMENT 11A RESULTS

## AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				DIF	AVERAGE DELAYS		FIX TO THRESH	TRAVEL	GATE TO ROLL		
	RWY 9L	RWY 12	RWY	RWY	RWY 9L	RWY 12	RWY	RWY		ARR	DEP					
1100-1200	26.9	20.4	0.0	0.0	0.0	3.3	13.0	3.0	0.0	0.0	0.0	19.3	21.0	-1.7	11.20	5.04
1200-1300	29.0	24.6	0.0	0.0	0.0	21.1	22.0	3.0	0.0	0.0	0.0	46.1	52.0	-7.6	12.72	13.79
1300-1400	26.7	20.0	0.0	0.0	0.0	22.9	27.0	5.7	0.0	0.0	0.0	55.6	57.0	-9.0	11.24	14.89
1400-1500	25.4	15.9	1.0	0.0	0.0	20.7	12.2	7.3	0.0	0.0	0.0	40.2	33.0	-1.8	10.74	16.42
1500-1600	27.0	27.4	1.3	0.0	0.0	13.4	17.8	2.1	0.0	0.0	0.0	33.3	34.0	-2.5	11.43	8.64
1600-1700	23.0	18.7	.7	0.0	0.0	12.6	19.8	3.9	0.0	0.0	0.0	36.3	35.0	-1.2	11.17	8.15
1700-1800	14.0	18.0	1.0	0.0	0.0	20.3	27.6	6.5	0.0	0.0	0.0	54.4	62.0	-8.8	10.24	12.17
1800-1900	16.0	16.0	1.0	0.0	0.0	13.4	21.6	4.7	0.0	0.0	0.0	39.7	35.0	-4.1	10.13	9.01
1900-2000	0.0	0.0	0.0	0.0	0.0	3.3	0.0	.8	0.0	0.0	0.0	4.1	0.0	-0.0	0.00	10.22
AVERAGE DELAYS																
TIME	ARRIVALS				DEPARTURES				RNY TAXI OUT	RNY CRS	AVERAGE DELAYS		RNY CNG	RNY DELAY	RNY DEP	
	RWY 9L	RWY 12	RWY	RWY	RWY 9L	RWY 12	RWY	RWY			ARR	DEP				
1100-1200	1.6	.6	0.0	0.0	0.0	2.2	.9	1.1	0.0	0.0	0.0	1.2	0.0	0.0	1.3	1.2
1200-1300	2.6	3.2	0.0	0.0	0.0	11.9	6.0	2.7	0.0	0.0	0.0	8.4	.0	.5	3.4	9.0
1300-1400	1.6	1.5	0.0	0.0	0.0	17.5	3.7	3.1	0.0	0.0	0.0	9.3	.1	.3	2.1	10.4
1400-1500	1.4	.5	3.7	0.0	0.0	16.6	2.0	7.4	0.0	0.0	0.0	10.5	.0	.4	1.2	11.6
1500-1600	1.3	2.7	2.0	0.0	0.0	3.3	4.5	.6	0.0	0.0	0.0	3.8	.0	.3	2.4	4.2
1600-1700	1.4	5.7	0.0	0.0	0.0	5.2	2.4	4.5	0.0	0.0	0.0	3.6	.1	.3	1.5	4.0
1700-1800	.3	1.2	0.0	0.0	0.0	3.0	8.8	8.0	0.0	0.0	0.0	6.5	.0	1.1	.8	7.6
1800-1900	.4	.5	0.0	0.0	0.0	4.4	2.2	6.3	0.0	0.0	0.0	3.7	.1	.7	.8	4.5
1900-2000	0.0	0.0	0.0	0.0	0.0	4.3	0.0	4.5	0.0	0.0	0.0	4.6	0.0	.1	0.0	4.7

VFRI East Comparison:  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand  
versus  
No Improvements, with 1983 Demand

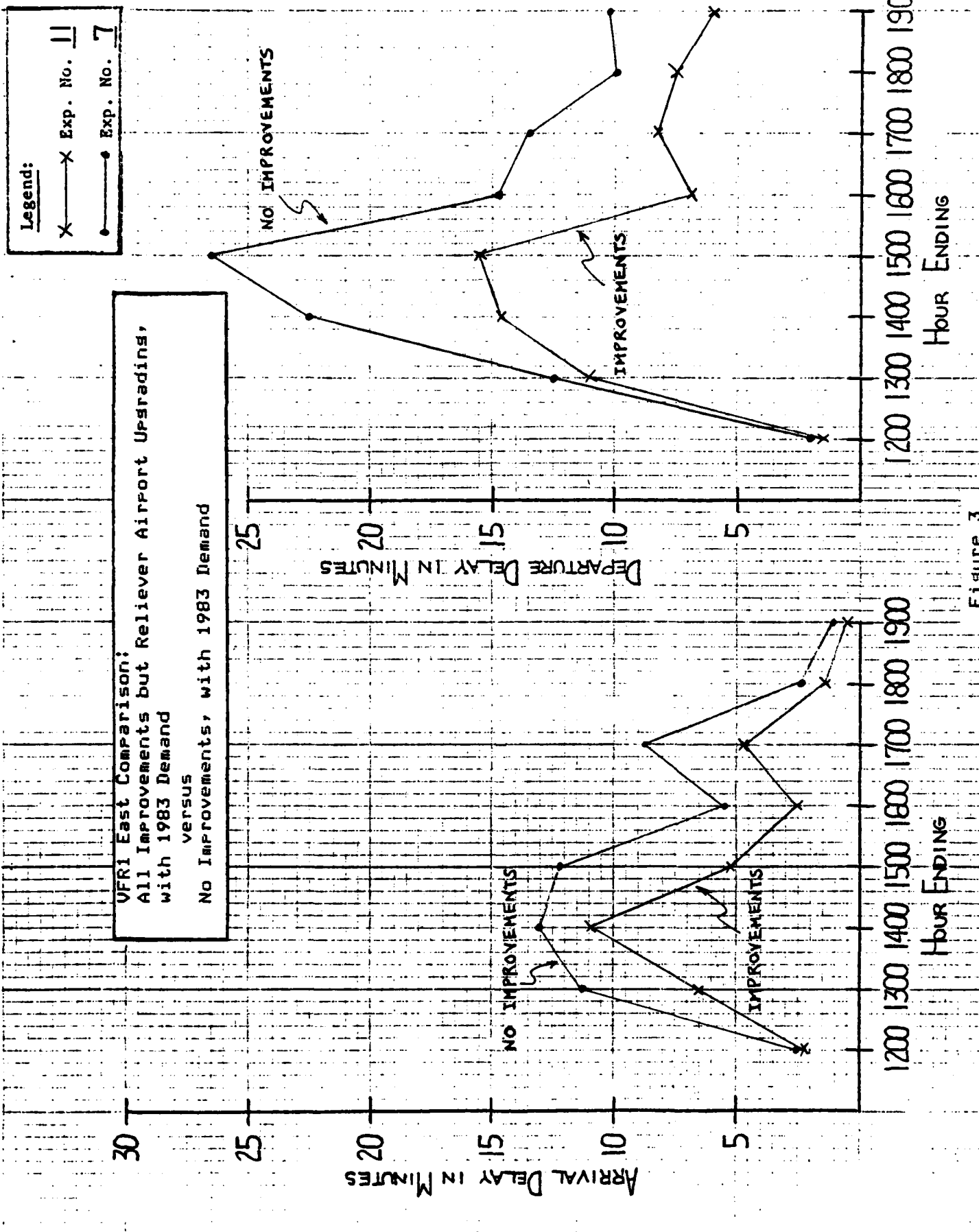


Figure 3

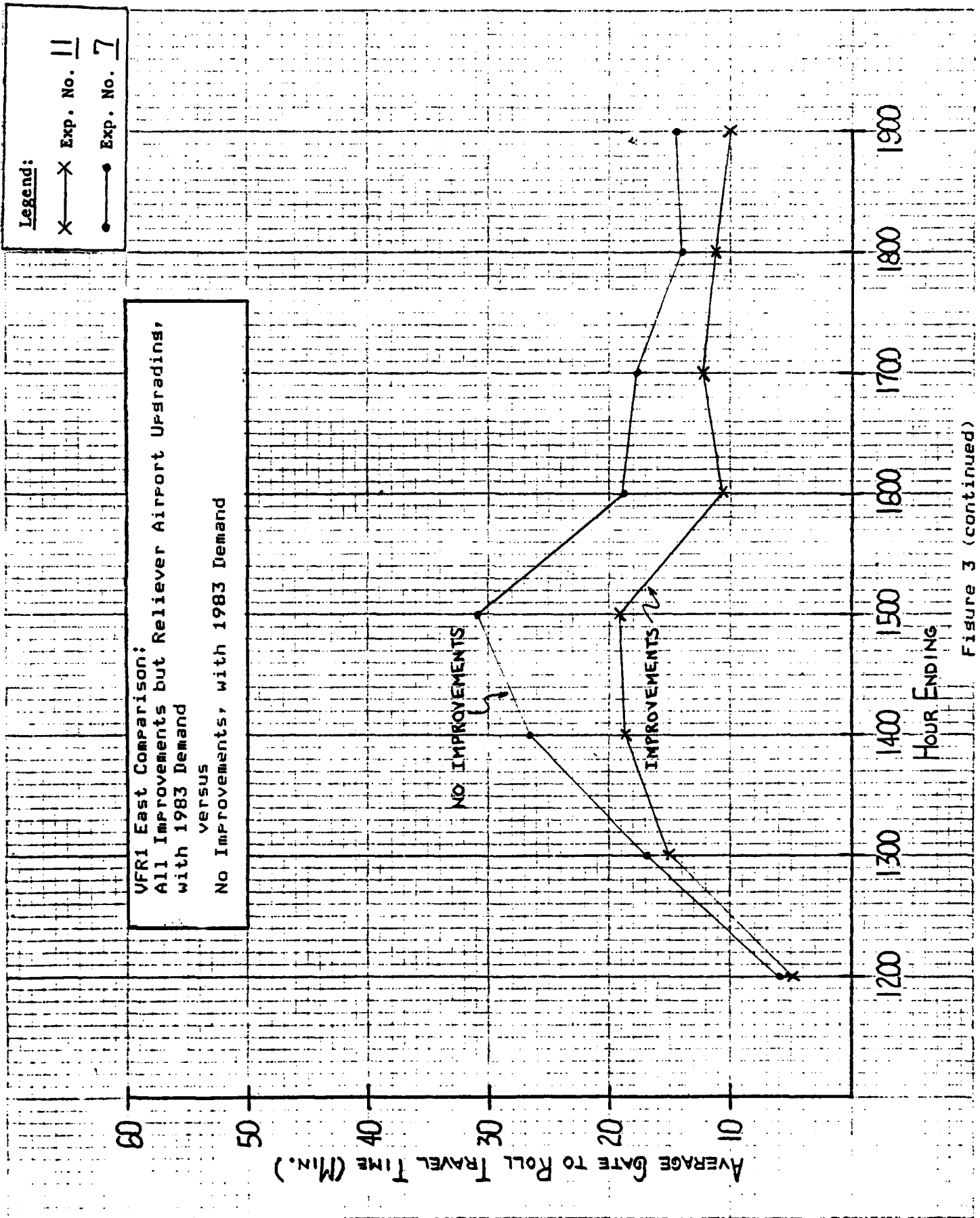


Figure 3 (continued)

Legend:

- X Exp. No. 11
- Exp. No. 7

VFR1 East Comparison:  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand  
versus  
No Improvements, with 1983 Demand

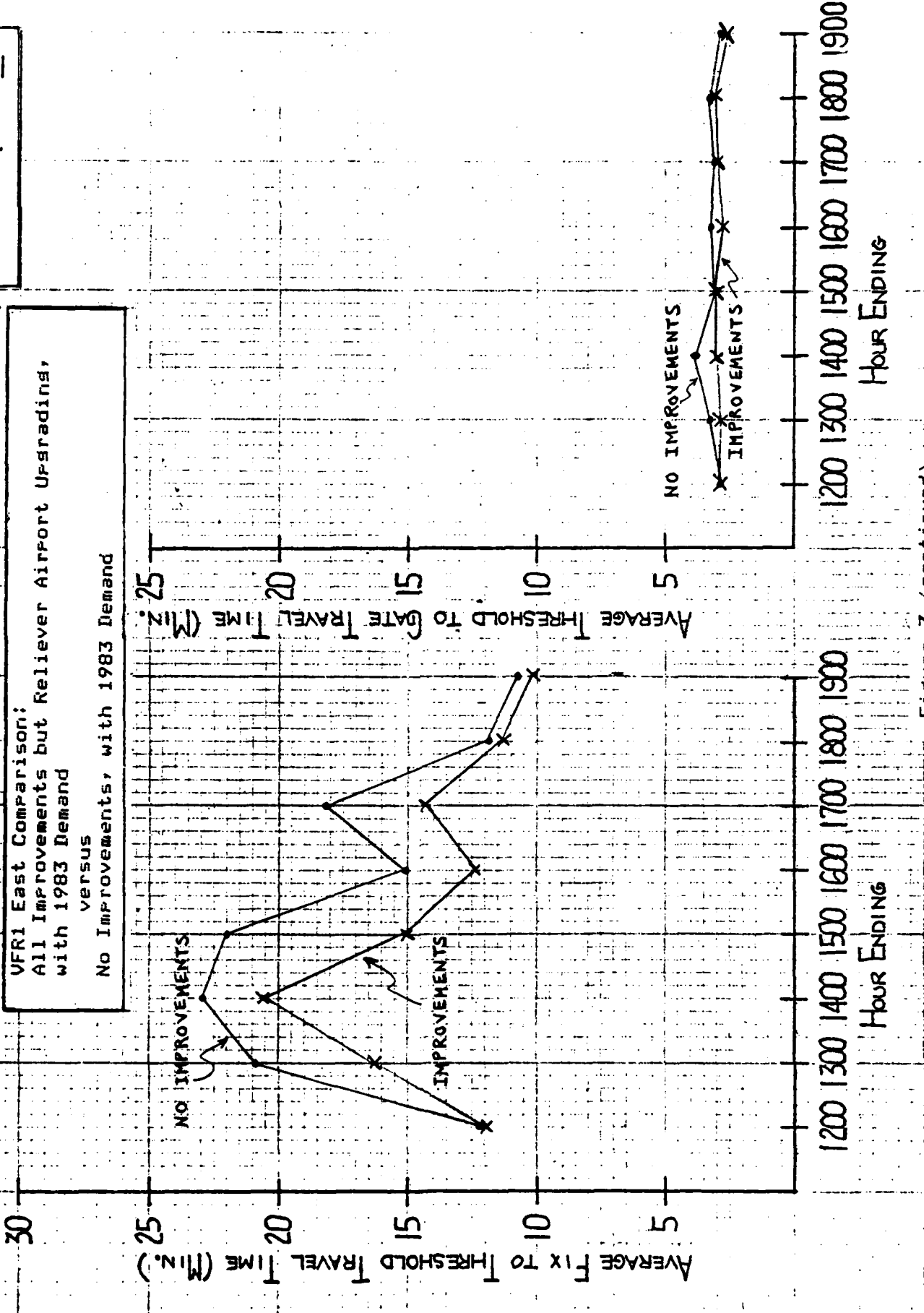


Figure 3 (continued)

VFR1 East Comparison:  
No Improvements but Reliever Airport Upgrading and  
the 1983 ATC System Scenario, with 1983 Demand  
versus  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand

Legend:  
X Exp. No. IIA  
● Exp. No. II

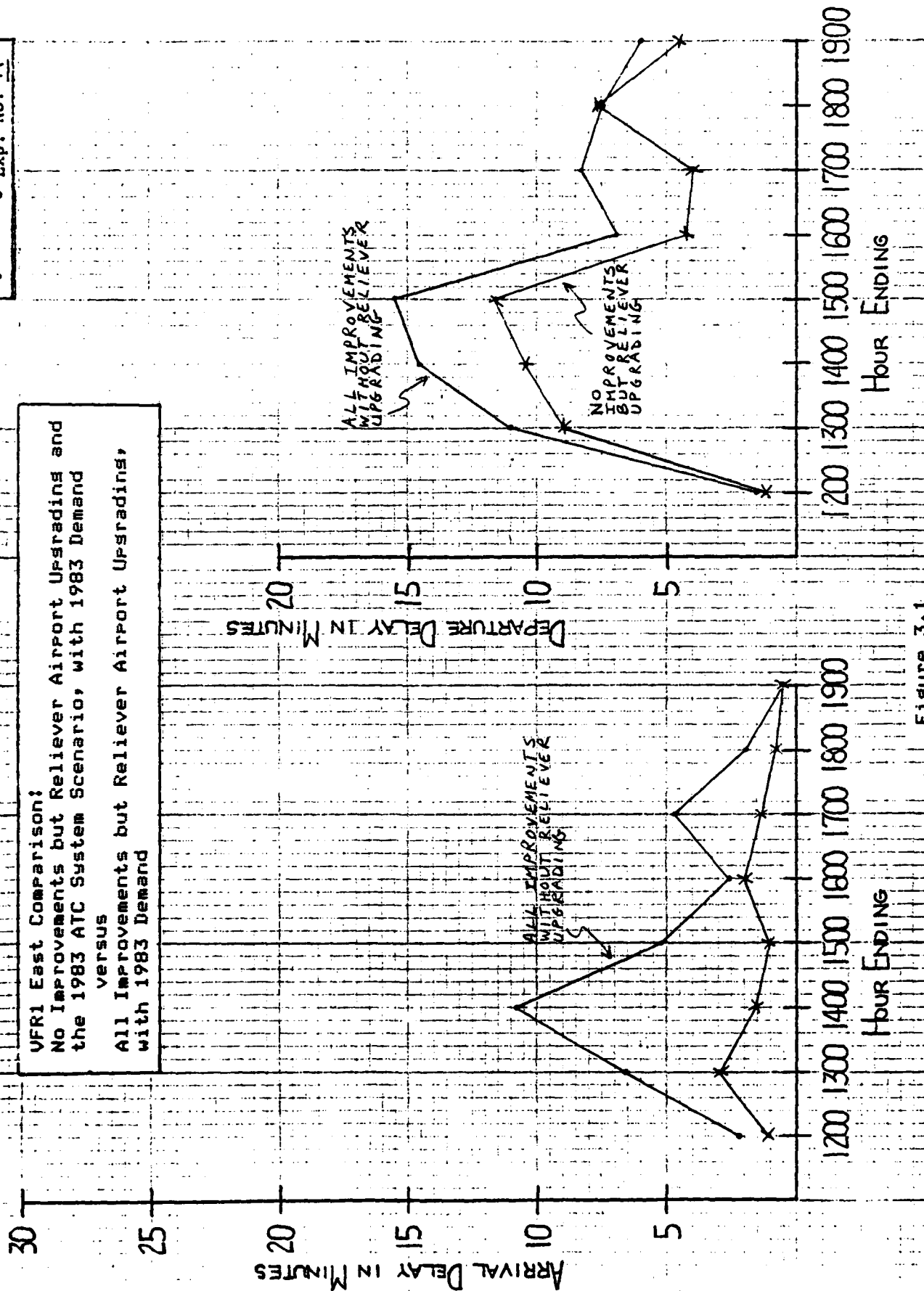


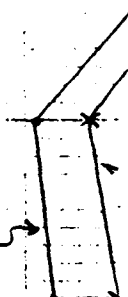
Figure 3.1

GATE TO ROLL TRAVEL TIME (Min.)

VFR1 East Comparison:  
 No Improvements but Reliever Airport Upgrading and  
 the 1983 ATC System Scenario, with 1983 Demand  
 versus  
 All Improvements but Reliever Airport Upgrading,  
 with 1983 Demand

Legend:  
 X — Exp. No. IIA  
 • — Exp. No. II

ALL IMPROVEMENTS  
 WITHOUT RELIEVER  
 UPGRADING



VFR1 East Comparison:  
 No Improvements but Reliever Airport Upgrading and  
 the 1983 ATC System Scenario, with 1983 Demand  
 versus  
 All Improvements but Reliever Airport Upgrading,  
 with 1983 Demand

Legend:  
 X — Exp. No. 11A  
 • — Exp. No. 11

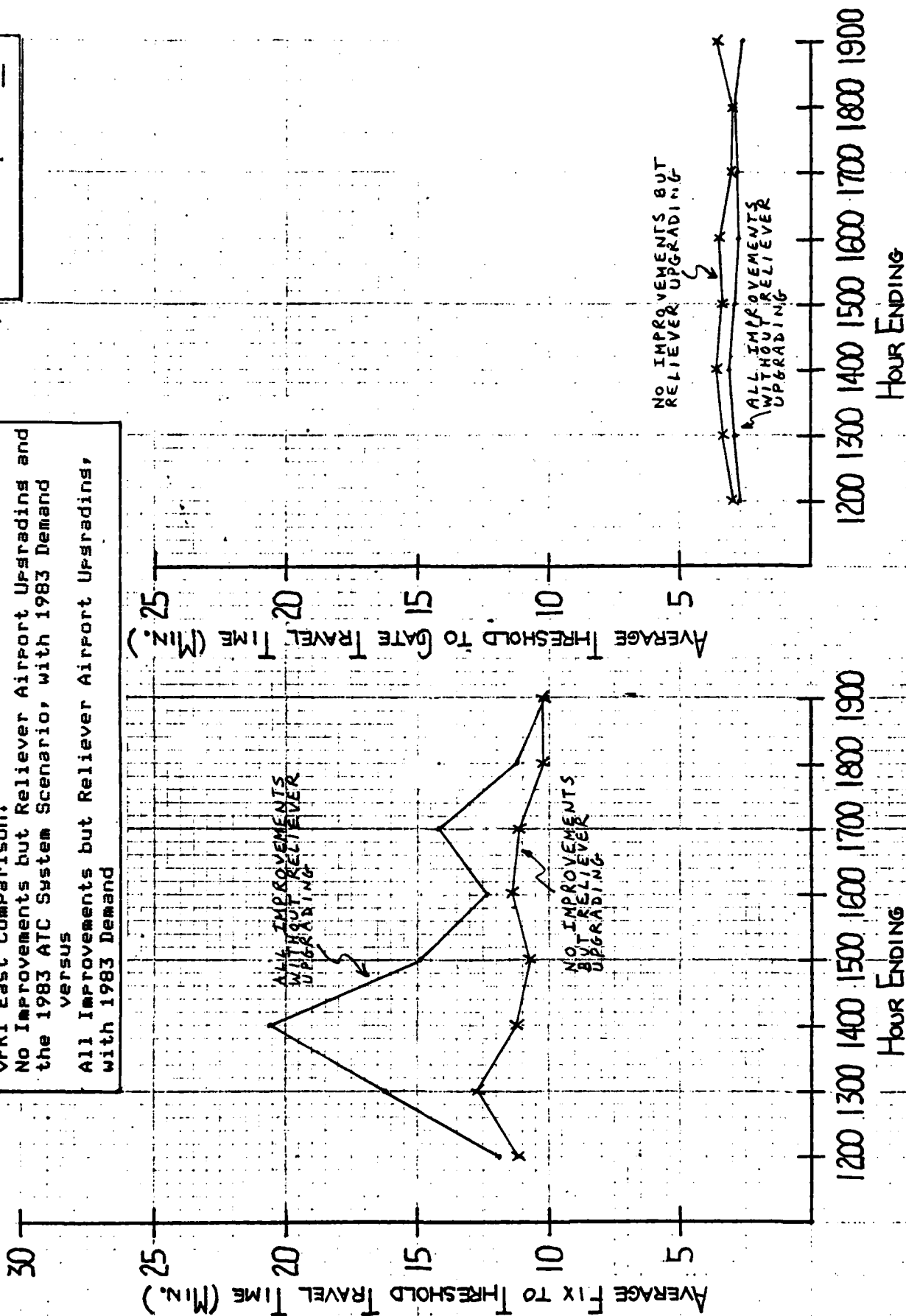


Figure 3.1 (continued)

## EXPERIMENT NO. 14

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami near-term improvements including a 50-percent reduction in G.A. traffic due to Reliever Airport upgradings:

Arrival Runways

9L,9R,12

Departure Runways

9L,9R,12

### Related Comparison Experiments:

Prior experiment 11 serves as the basis for comparison to this experiment, wherein the conditions of this study case were identical except for the 50-percent reduction in G.A. traffic due to the upgradings of Opa Locka and Tamiami.

VFR1- Ceiling above 1500 ft. and visibility over 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980



## EXPERIMENT 14 RESULTS

### AVERAGE FLOW RATES

**D-10**

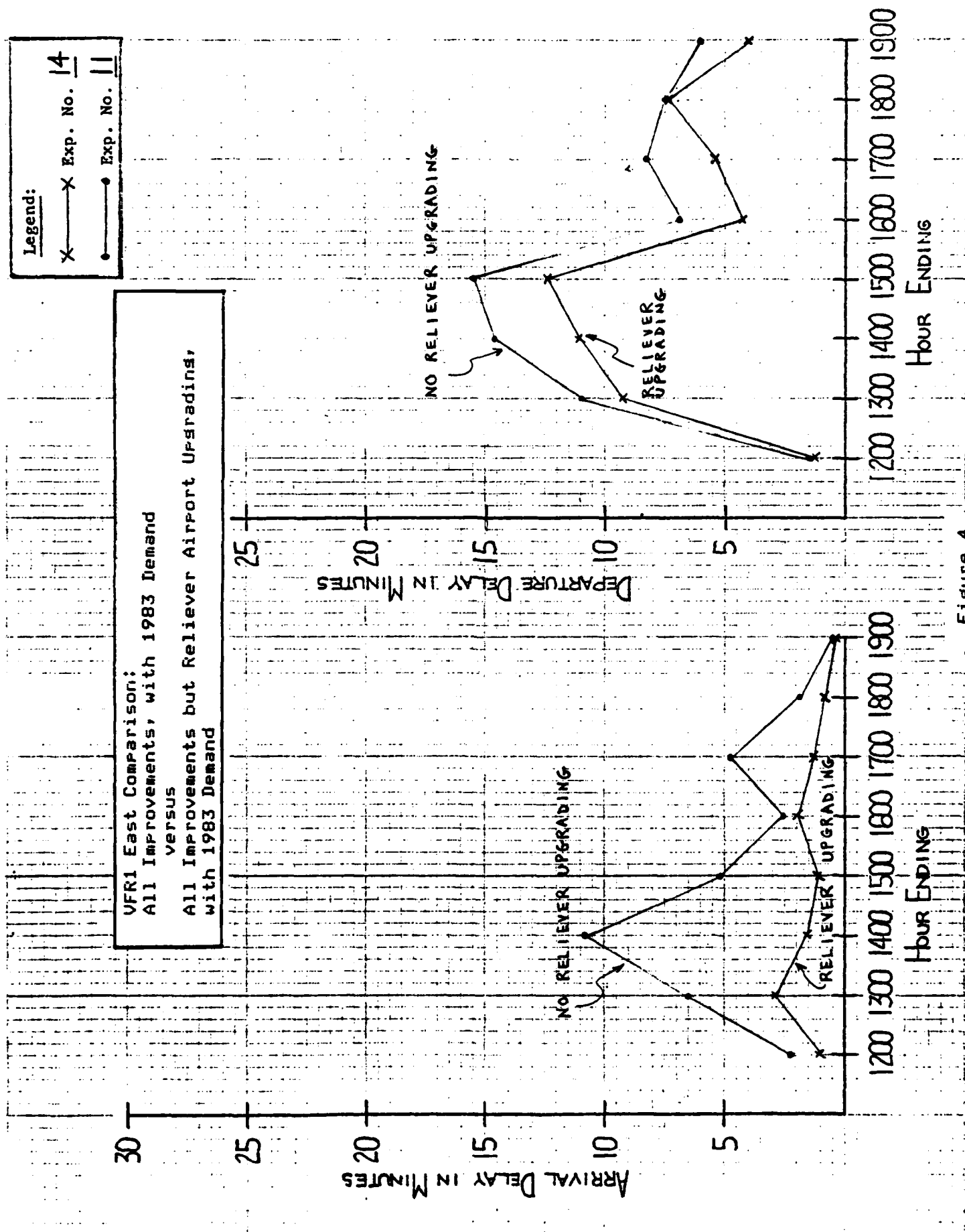


Figure 4

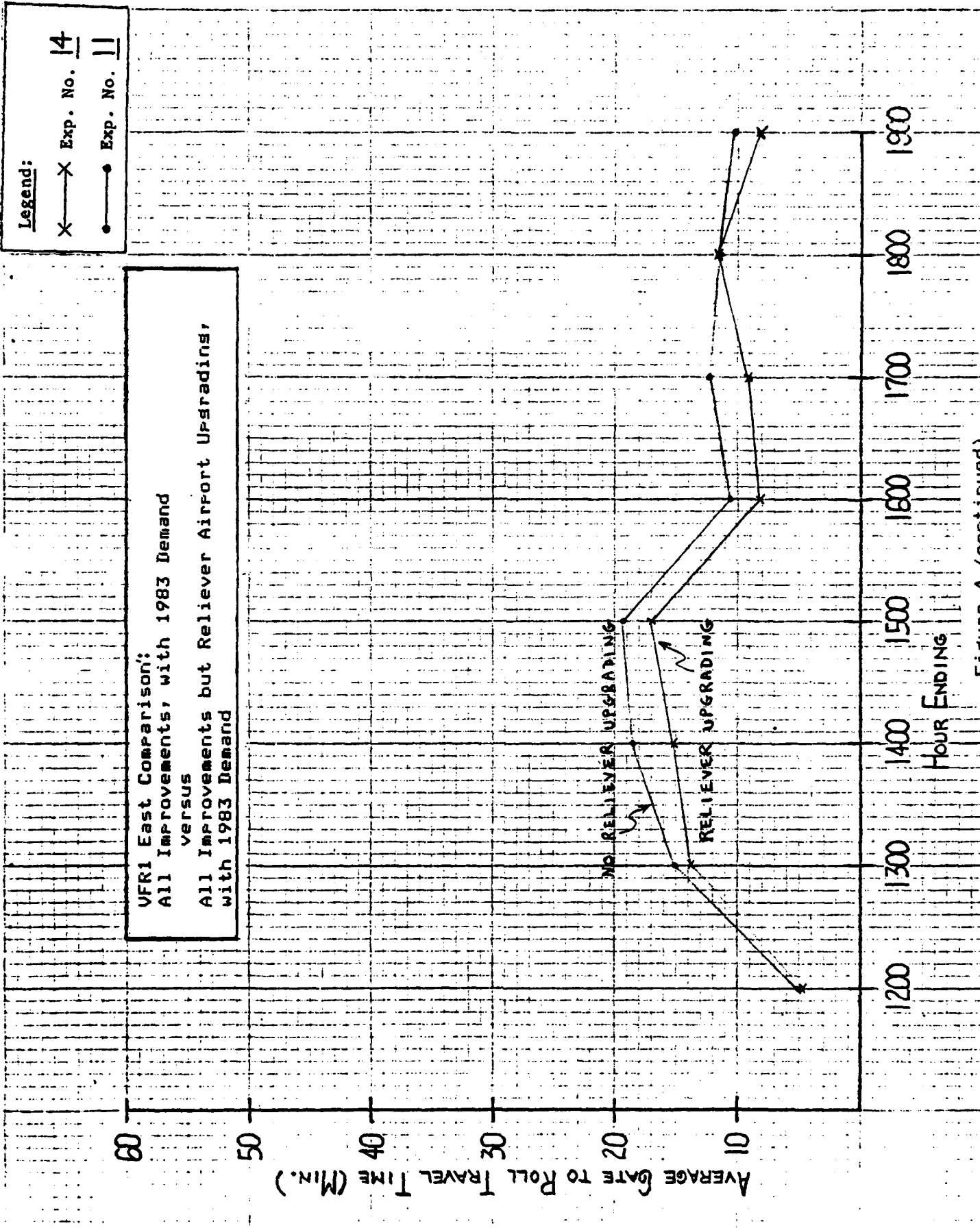


Figure 4 (continued)

VFR1 East Comparison:  
All Improvements, with 1983 Demand  
versus  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand

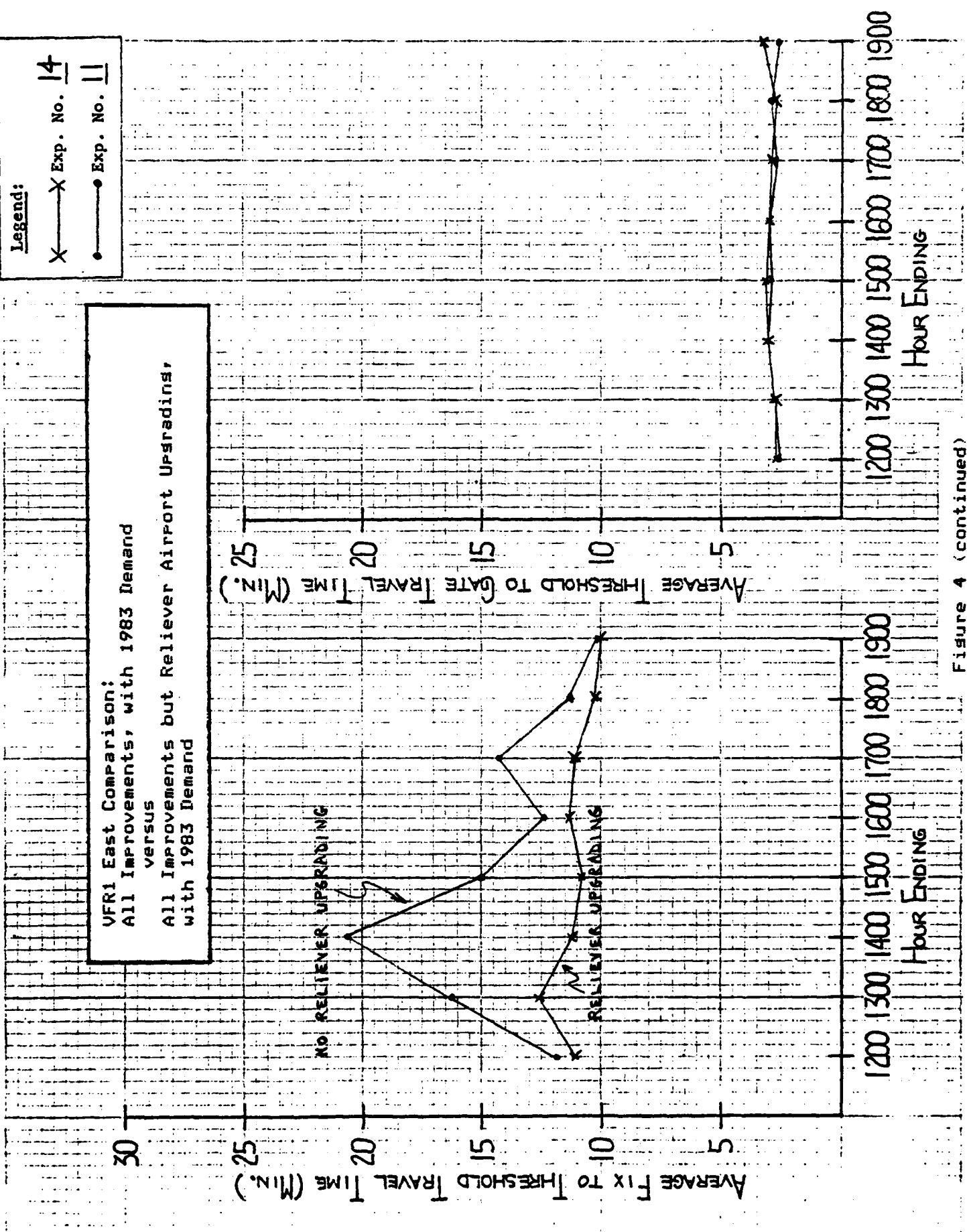


Figure 4 (continued)

TABLE 11

SET 2 DEMAND  
IFR, EASTERLY FLOW

EXPERIMENT NUMBER		RUNWAY 9R	RUNWAY 9L	RUNWAY 12	TOTAL
9,35,10 AND 21	ARRIVALS	189	148	0	337
	DEPARTURES	129	149	37	315
	TOTAL	318	297	37	652
6 (4)	ARRIVALS	133	135	0	268
	DEPARTURES	102	139	29	270
	TOTAL	235	274	29	538
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				

Note: Runway closure during the IFR2 time period in Experiment Nos. 10 and 6 is performed by the model.

## EXPERIMENT NO. 9

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming the improved (1983) ATC system scenario and no Miami near-term improvements except for a 50-percent reduction in G.A. traffic due to Reliever Airport upgrading:

Arrival Runways

9L,9R

Departure Runways

9L,9R,12

### Related Comparison Experiments:

Prior experiment 34 (Data Package No. 5) serves as the 1983 demand level baseline for comparison to this experiment. Experiment 35 assesses the expected delays after adding the Miami-specific improvements to this study case.

IFR1- Ceilings between 200 ft. and 1000 ft. and/or  
visibility between 2400 ft. RVR and 3 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 12  
EXPERIMENT 9 RESULTS

MIAMI INTER. AIRPORT EXPER.-9 ROUTES=1978 CONFIG-A SEPAR-831FR1 DEMAND=83  
AVERAGE FLOW RATES

TIME	ARRIVALS										DEPARTURES										AVERAGE TRAVEL TIMES							
	RWY 9L		RWY 12		RWY		RWY		RWY		RWY 9L		RWY 12		RWY		RWY		RWY		RWY		FIX TO THRESH		THRESH TO GATE		GATE TO ROLL	
	9R	12R	9L	12L	9R	12R	9L	12L	9R	12R	9L	12L	9R	12R	9L	12L	9R	12R	9L	12L	9R	12R	9L	12L	9R	12R	9L	12L
1100-1200	24.7	21.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1200-1300	29.2	21.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1300-1400	27.1	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1500-1600	25.2	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1600-1700	25.8	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1700-1800	14.1	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1800-1900	15.9	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE DELAYS																												
GRAND TOTAL																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												
AVERAGE DELAYS																												

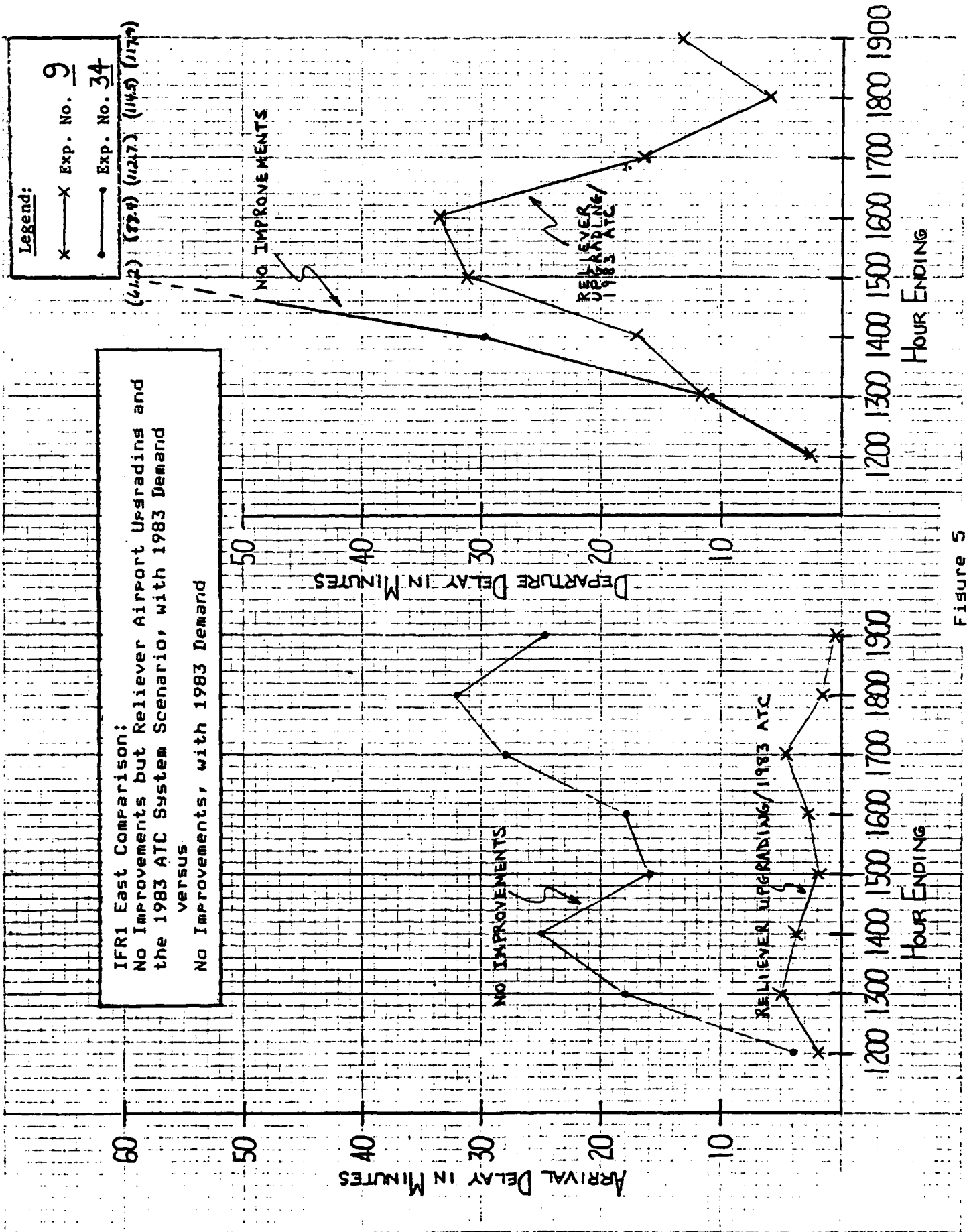


Figure 5



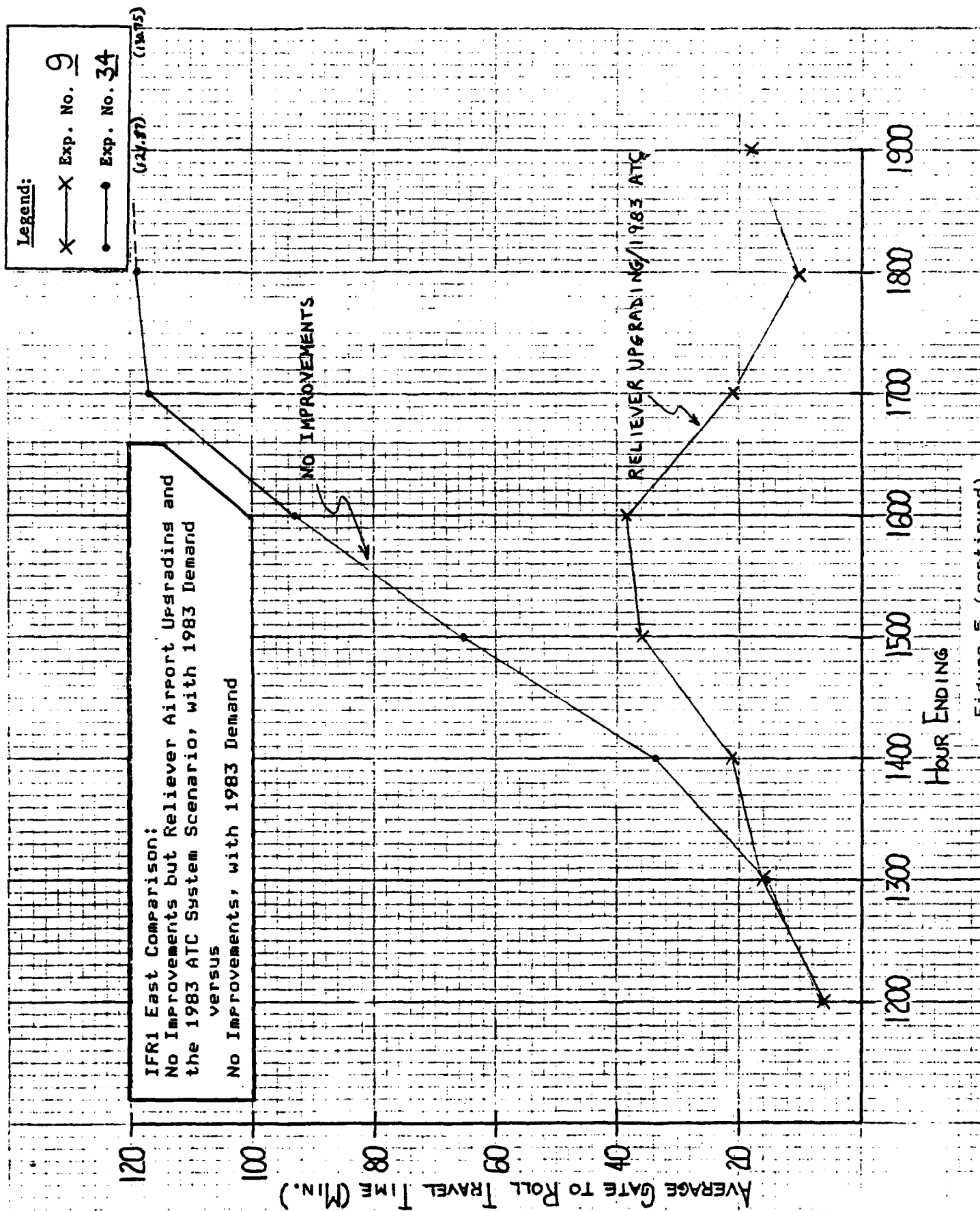


Figure 5 (continued)

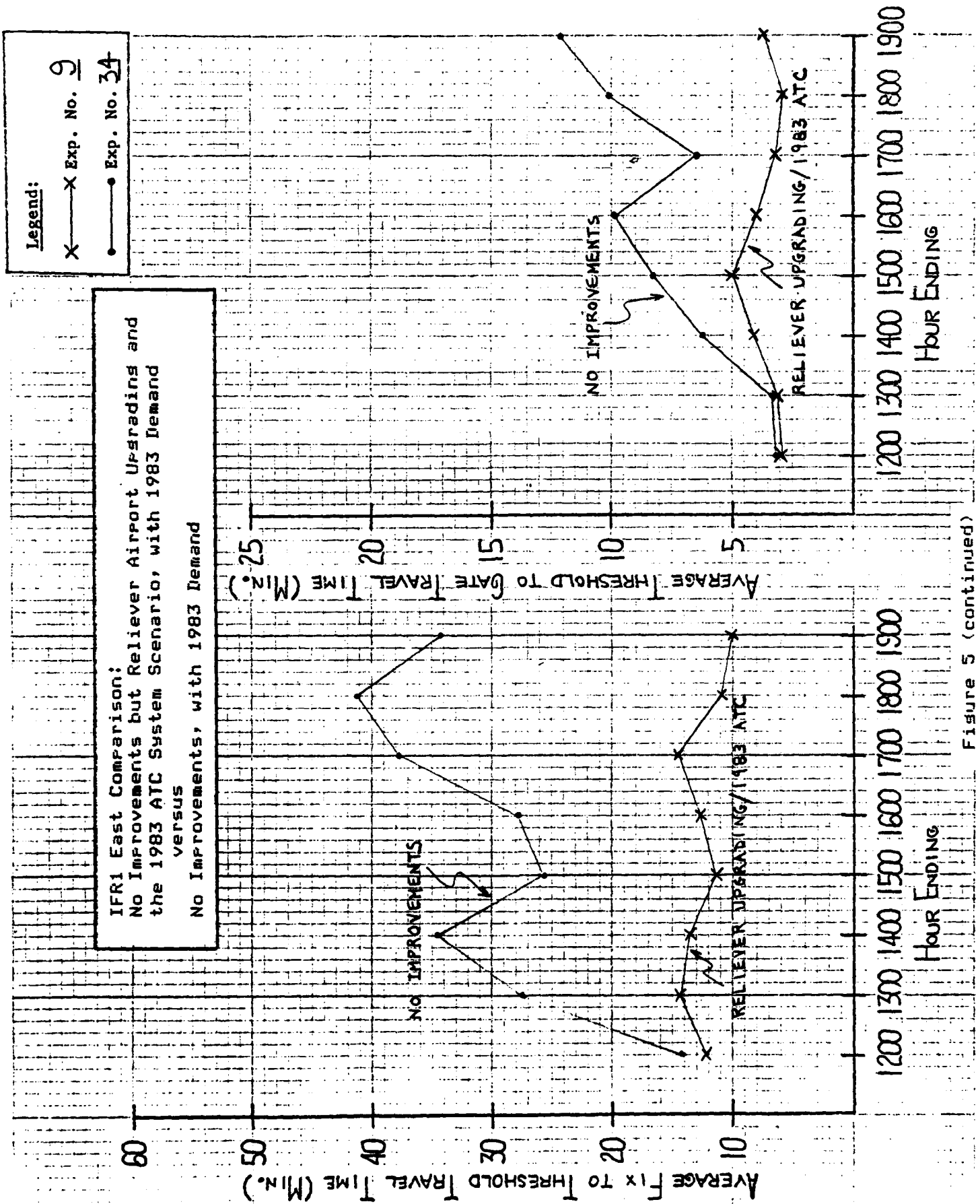


Figure 5 (continued)

## EXPERIMENT NO. 35

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami near-term improvements including a 50-percent reduction in G.A. traffic due to Reliever Airport upgradings:

Arrival Runways

9L,9R

Departure Runways

9L,9R,12

### Related Comparison Experiments:

Prior experiment 9 serves as the basis for comparison to this experiment, wherein the Miami-specific improvements were not included.

IFR1- Ceilings between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

## EXPERIMENT 35 RESULTS

**D-21**

TABLE 13.1

## EXPERIMENT 35M1 RESULTS

MIAMI INTER. AIRPORT EXPER.-35M1 ROUTES-1983 CONFIG-A SEPAR-831FR1 DEMAND-83

## AVERAGE FLOW RATES

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE TRAVEL TIMES		
	RWY 9R	RWY 12	RWY 9L	RWY 9R	RWY 12	RWY 9L		FIX TO THRESH	THRESH TO GATE	ROLL
1100-1200	24.5	21.9	0.0	0.0	0.0	0.0	-5.6	12.32	2.82	5.63
1200-1300	29.5	21.1	0.0	0.0	0.0	0.0	-2.0	14.38	2.65	15.13
1300-1400	27.0	17.0	0.0	0.0	0.0	0.0	-2.0	13.66	2.99	20.33
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	-2.0	11.32	2.86	33.82
1500-1600	25.0	28.1	0.0	0.0	0.0	0.0	-8.9	12.65	2.92	34.75
1600-1700	26.0	18.9	0.0	0.0	0.0	0.0	-1.1	14.59	2.98	23.33
1700-1800	13.9	16.0	0.0	0.0	0.0	0.0	-1.1	10.74	2.64	10.44
1800-1900	16.1	12.0	0.0	0.0	0.0	0.0	-0.0	10.08	3.14	10.31
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	-0.0	8.91	2.71	9.18

## AVERAGE DELAYS

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE DELAYS		
	RWY 9R	RWY 12	RWY 9L	RWY 9R	RWY 12	RWY 9L		ARR	DEP	
1100-1200	2.6	1.2	0.0	0.0	0.0	0.0	0.0	1.9	2.2	
1200-1300	5.0	4.7	0.0	0.0	0.0	0.0	0.0	4.9	10.8	
1300-1400	5.3	1.2	0.0	0.0	0.0	0.0	0.0	3.8	16.3	
1400-1500	2.6	4.4	0.0	0.0	0.0	0.0	0.0	1.9	29.2	
1500-1600	2.0	3.3	0.0	0.0	0.0	0.0	0.0	2.7	30.5	
1600-1700	6.9	1.9	0.0	0.0	0.0	0.0	0.0	4.9	19.1	
1700-1800	.9	2.0	0.0	0.0	0.0	0.0	0.0	1.5	6.0	
1800-1900	.4	.8	0.0	0.0	0.0	0.0	0.0	.6	6.0	
1900-2000	0.0	.4	0.0	0.0	0.0	0.0	0.0	.4	3.8	

TABLE 13.2

## EXPERIMENT 35M2 RESULTS

MIAMI INTER. AIRPORT EXPER.-35M2 ROUTES-1983 CONFIG-A SEPAR-831FR1 DEMAND-83  
AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				AVERAGE DELAYS				AVERAGE TRAVEL TIMES			
	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	DIF	TOT DE-HAND	TOT RHY	TOT DE-HAND	DIF	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.6	21.9	0.0	0.0	0.0	0.0	0.0	0.0	-5.5	44.5	52.0	52.0	-5.5	12.41	2.90	5.43
1200-1300	28.5	21.1	0.0	0.0	0.0	0.0	0.0	0.0	-2.9	49.6	47.0	47.0	-2.9	14.53	2.73	15.67
1300-1400	27.3	17.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.6	44.3	44.0	44.0	-2.6	15.13	3.08	19.53
1400-1500	27.4	13.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.2	40.4	38.0	38.0	-2.2	12.13	3.10	33.40
1500-1600	24.4	25.9	0.0	0.0	0.0	0.0	0.0	0.0	-9.9	50.3	60.0	60.0	-9.9	12.95	2.94	43.77
1600-1700	24.8	19.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	45.9	36.0	36.0	-0.0	16.27	3.06	28.85
1700-1800	13.7	14.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.3	29.7	31.0	31.0	-1.3	10.92	2.69	13.68
1800-1900	14.3	12.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	28.3	27.0	27.0	-0.0	10.21	3.19	11.56
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	2.0	2.0	2.0	-0.0	9.00	2.68	10.05
GRAND TOTAL																
TIME	ARRIVALS				DEPARTURES				AVERAGE DELAYS				AVERAGE DELAYS			
	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	TAXI IN	TOT CRS	TOT RHY	TOT CRS	TAXI OUT	ARR DELAY	DEP DELAY	
1100-1200	2.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.1	
1200-1300	5.2	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	0.0	5.0	11.3	
1300-1400	7.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.0	5.3	0.0	5.3	15.6	
1400-1500	3.7	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.6	0.0	2.6	0.0	2.8	29.0	
1500-1600	2.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	39.3	
1600-1700	9.6	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	6.5	0.0	6.5	24.6	
1700-1800	1.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.6	0.0	1.7	9.2	
1800-1900	.6	.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.7	0.0	.7	0.0	.7	7.3	
1900-2000	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	.5	0.0	.5	4.6	

# IFR1 East Comparison:

All Improvements, with 1983 Demand  
versus

No Improvements but Reliever Airport Upgrading and  
the 1983 ATC System Scenario, with 1983 Demand

## Note:

Experiment 35 employs the 2200 ft. displaced  
landing threshold on runway 9R.

Experiment 35M1 employs a 3650 ft. displaced  
landing threshold on runway 9R, thus repositi-  
oning the threshold back to the "today's"  
airport position.

Average Runway 9R Arrival Runway Occupancy  
Time by Class:

A. With 2200 Ft. Displaced Threshold:

Class 1	Class 2	Class 3	Class 4
70.1 s.	59.8 s.	57.1 s.	45.2 s.

B. With 3650 Ft. Displaced Threshold:

Class 1	Class 2	Class 3	Class 4
62.8 s.	51.8 s.	46.3 s.	29.1 s.

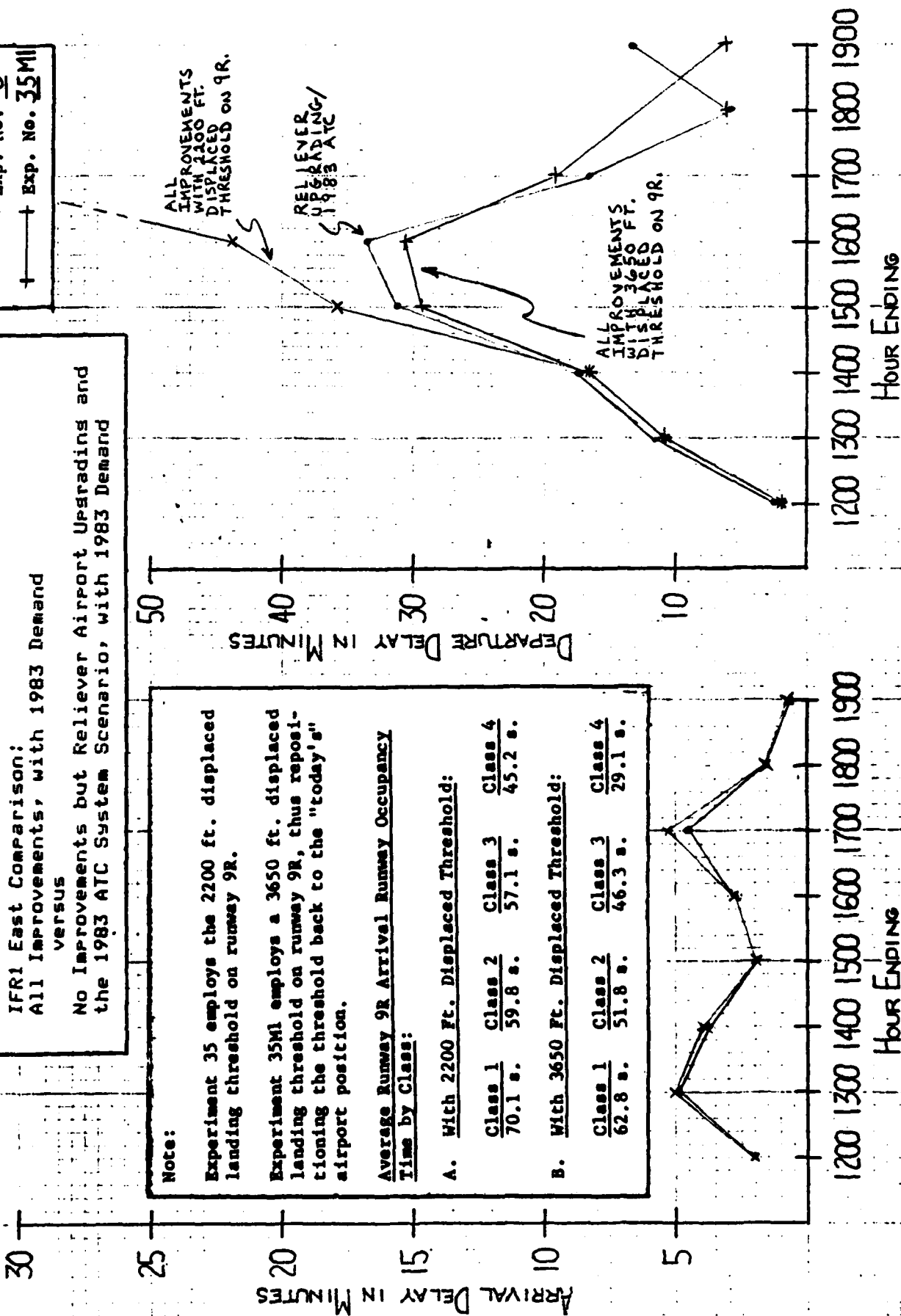


Figure 6

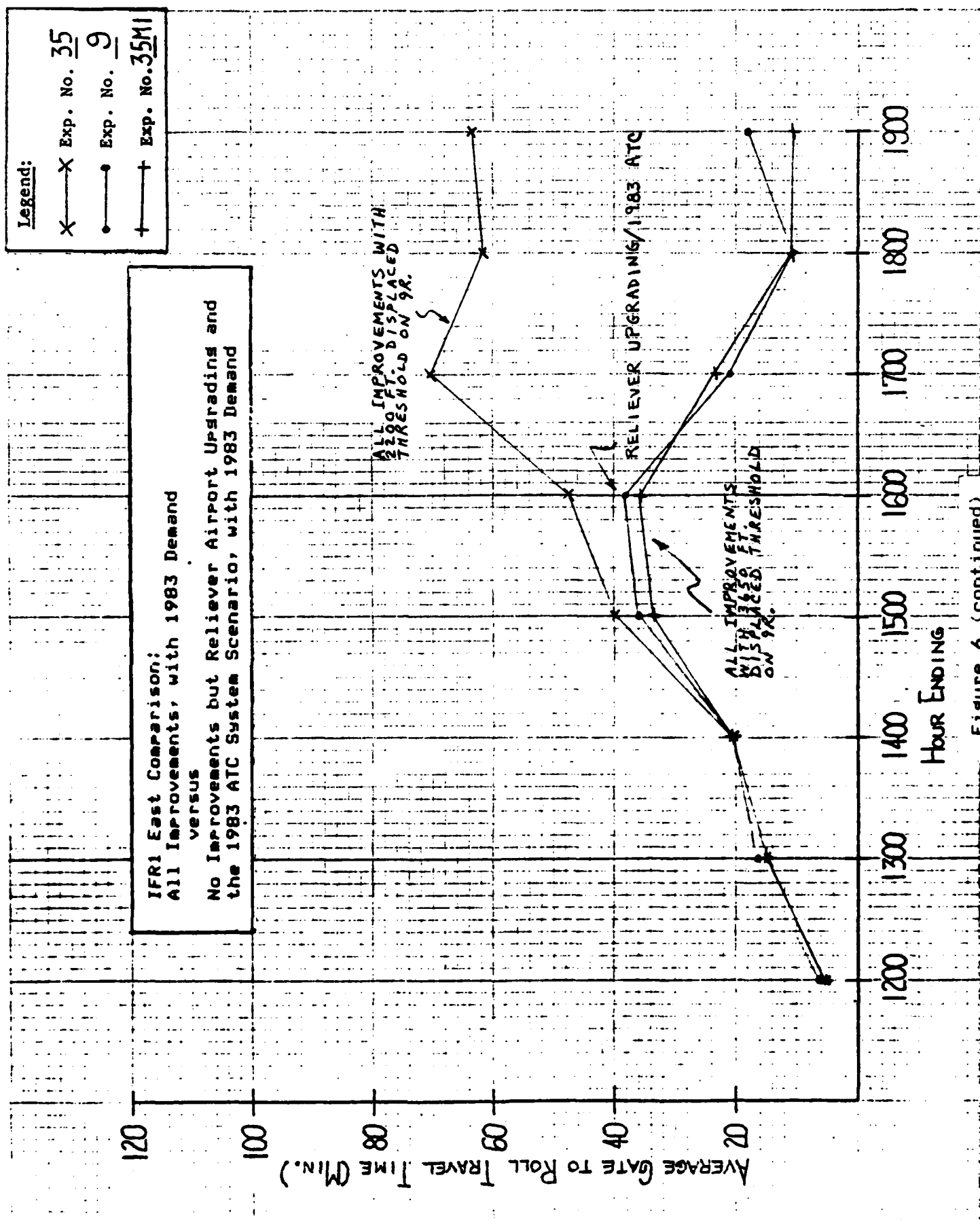


Figure 6 (continued)



Legend:

X Exp. No. 35

● Exp. No. 9

+ Exp. No. 35MI

IFR1 East Comparison:  
All Improvements, with 1983 Demand  
versus  
No Improvements but Reliever Airport Upgrading and  
the 1983 ATC System Scenario, with 1983 Demand

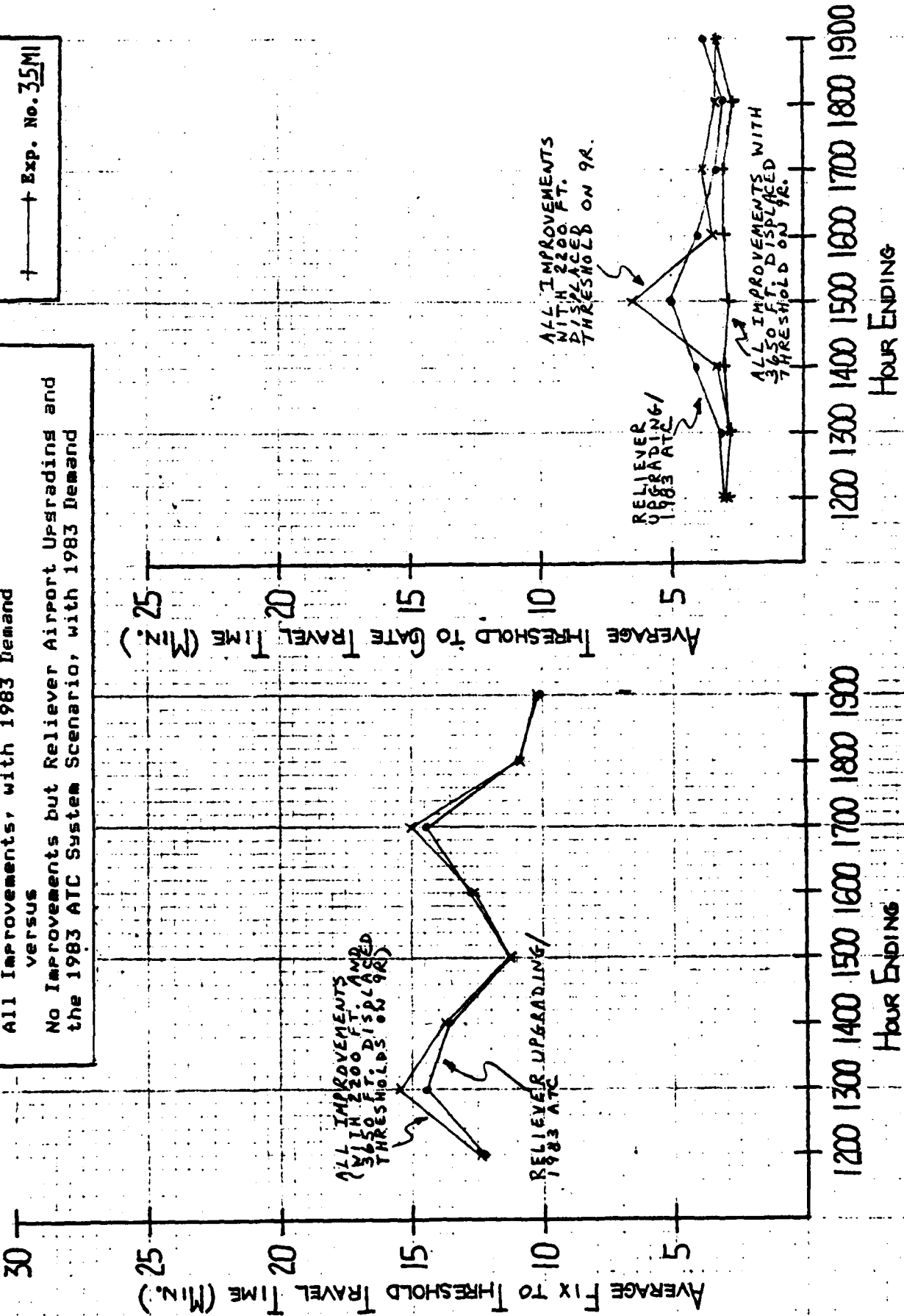


Figure 6 (continued)

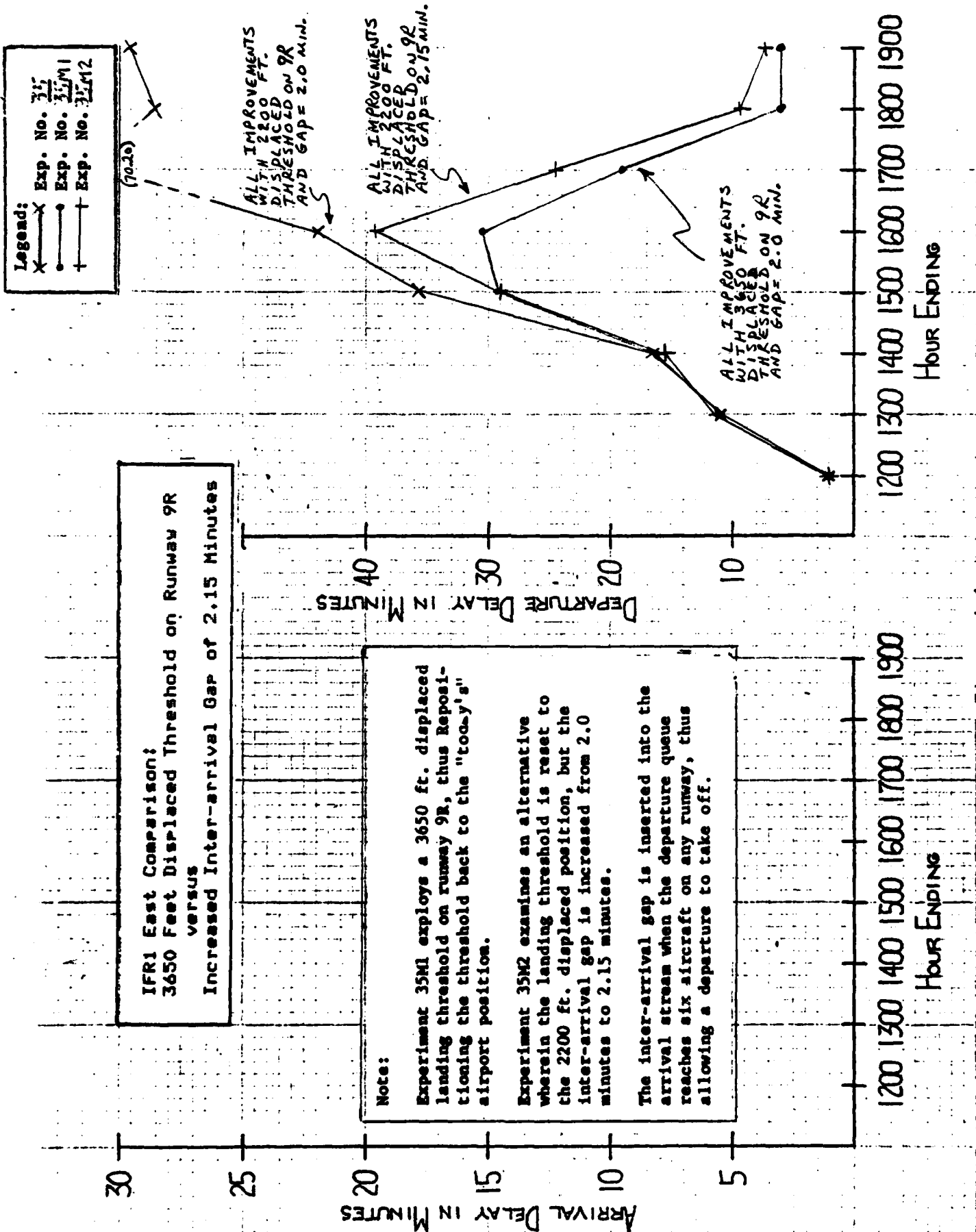


Figure 6.1

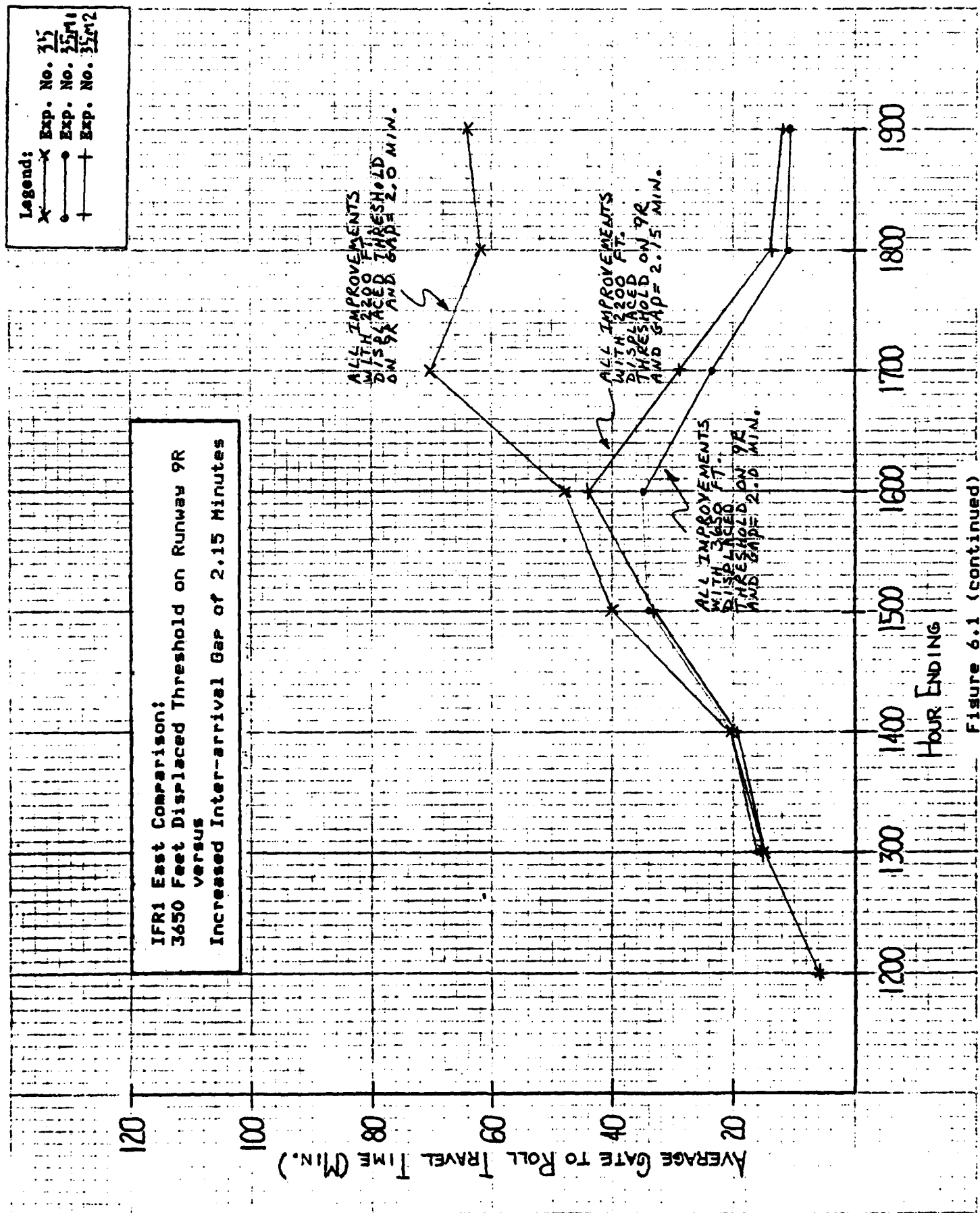


Figure 6.1 (continued)

## EXPERIMENT NO. 6

### Objective:

To assess the delay impact to aircraft in 1978 for the following runway configuration under IFR2 conditions:

Arrival Runways	Departure Runways
None	9L

### Related Comparison Experiments:

Prior experiment 4 (Data Package No. 5) examines this configuration with IFR1 weather and 1978 demand.

Experiment 10 assesses the delay impact of increased, 1983 demand with no improvements except for G.A. Reliever Airport upgrading.

(An IFR1/IFR2/IFR1 situation was used for this experiment, with the IFR2 conditions lasting from 1300 to 1400 hours. This enables the recovery of the airport from the IFR2 deterioration to be studied.)

IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.

IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

## EXPERIMENT 6 RESULTS

[illegible][illegible]

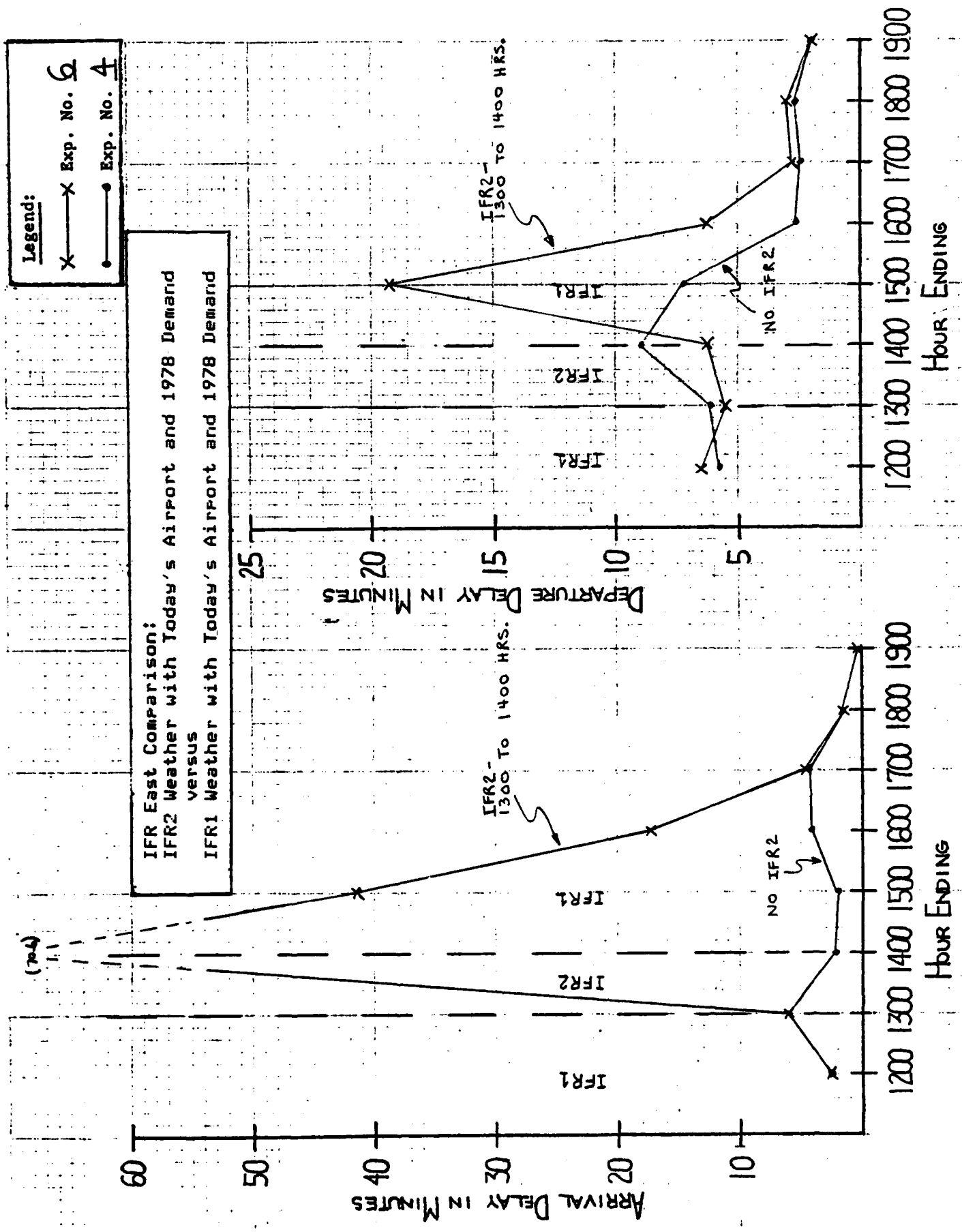


Figure 7

Legend:  
X Exp. No. 6  
• Exp. No. 4

IFR East Comparison:  
IFR2 Weather with Today's Airport and 1978 Demand  
versus  
IFR1 Weather with Today's Airport and 1978 Demand

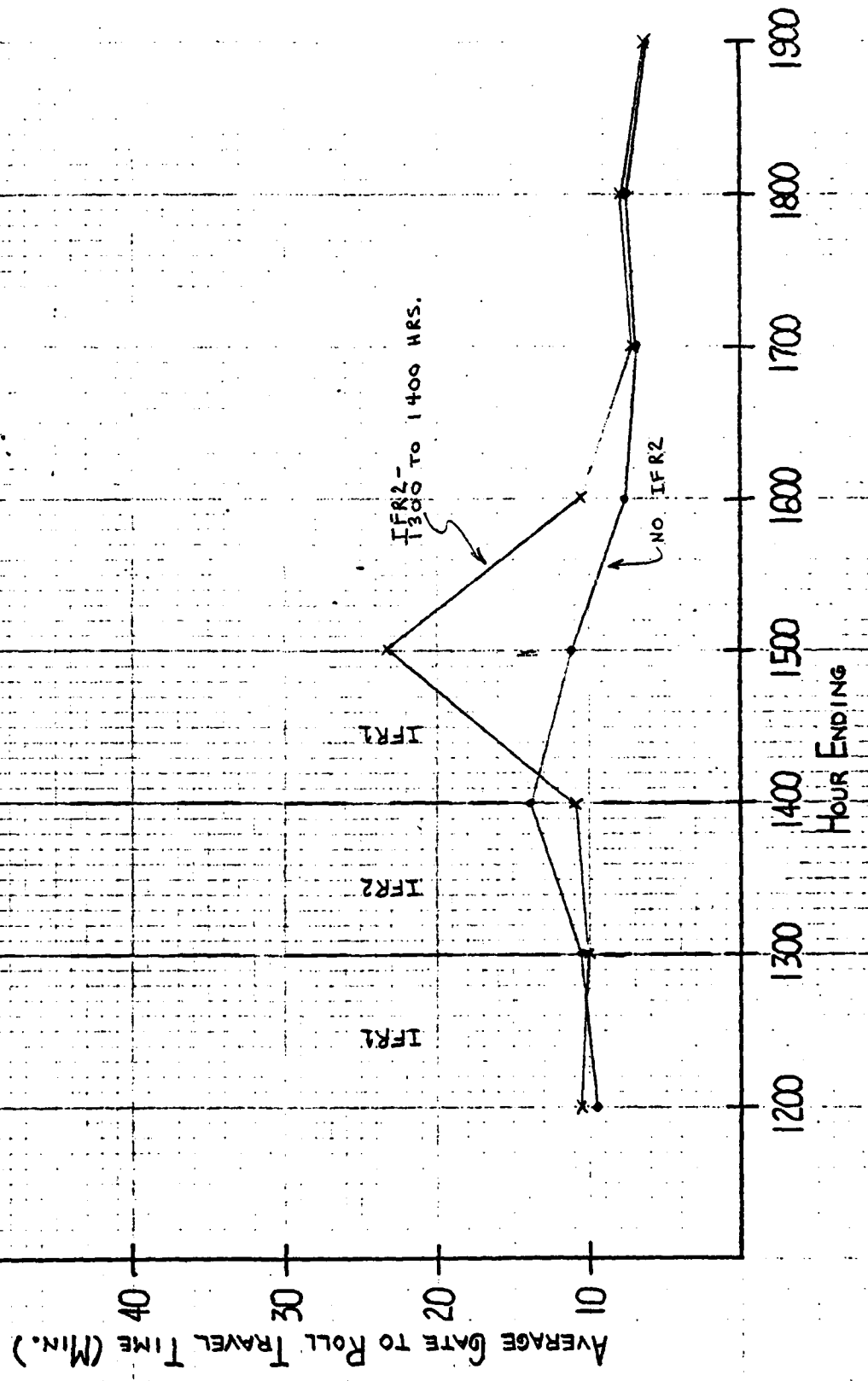


Figure 7 (continued)

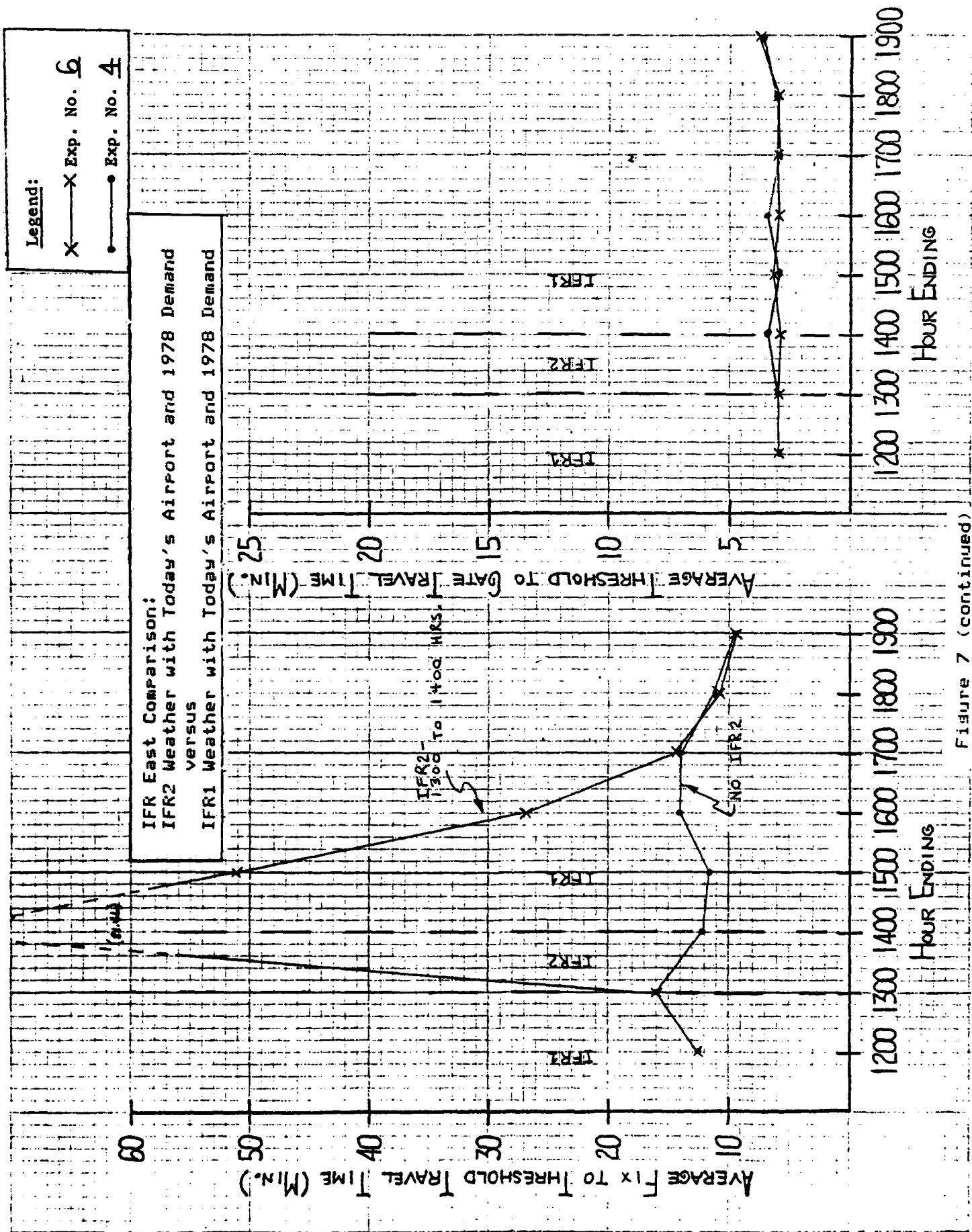


Figure 7 (continued)



## EXPERIMENT NO. 10

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR2 conditions, assuming the improved (1983) ATC system scenario and no Miami near-term improvements except for a 50-percent reduction in G.A. traffic due to Reliever Airport upgrading:

Arrival Runways

None

Departure Runways

9L

### Related Comparison Experiments:

Prior experiment 6 serves as the 1978 demand level baseline for comparison to this experiment.

Experiment 21 assesses the expected delays after adding the Miami-specific improvements to this study case.

(An IFR1/IFR2/IFR1 situation was used for this experiment, with the IFR2 conditions lasting from 1300 to 1400 hours. This enables the recovery of the airport from the IFR2 deterioration to be studied.)

IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.

IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

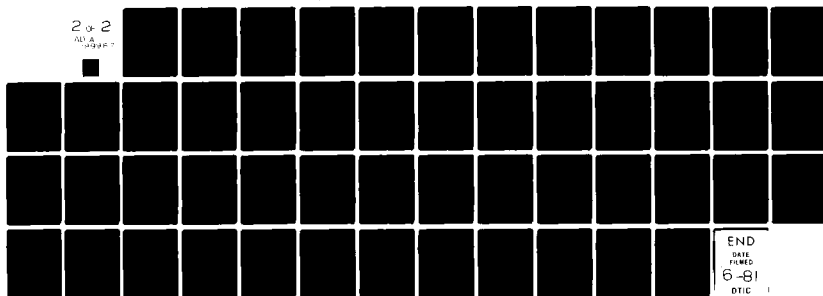
AD-A099 967

FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATL--ETC F/G 1/2  
MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 6. AIRPORT IMPR--ETC(U)  
MAY 80

UNCLASSIFIED

NL

2 of 2  
AD-A  
-999-7



END  
DATE  
FILMED  
6-81  
DTIC

TABLE 15

## EXPERIMENT 10 RESULTS

MIAMI INTER. AIRPORT EXPER.-10 ROUTES-1978 CONFIG-A SEPAR-831FR1-IFR2 DEMAND-83

## AVERAGE FLOW RATES

TIME	ARRIVALS			DEPARTURES			TOT DE- MAND	DIF	AVERAGE TRAVEL TIMES						
	RWY 9R	RWY 9L	RWY 12	RWY 9R	RWY 9L	RWY 12			FIX TO THRESH	THRESH TO GATE	ROLL				
1100-1200	24.7	21.9	0.0	0.0	0.0	0.0	46.6	52.0	-5.4	2.6	11.8	2.4	12.38	3.01	6.22
1200-1300	29.2	21.1	0.0	0.0	0.0	0.0	50.3	47.0	-2.1	15.1	20.2	3.3	14.42	3.08	16.30
1300-1400	1.0	0.0	0.0	0.0	0.0	0.0	1.0	44.0	-45.1	0.0	38.6	1.1	40.78	3.52	16.24
1400-1500	29.3	24.4	0.0	0.0	0.0	0.0	53.8	38.0	-29.3	14.1	23.4	4.9	68.43	4.00	51.62
1500-1600	30.1	31.0	0.0	0.0	0.0	0.0	61.1	60.0	-28.2	15.0	18.1	2.9	42.10	3.46	31.80
1600-1700	30.6	19.6	0.0	0.0	0.0	0.0	50.1	36.0	-14.1	14.3	19.9	4.2	37.55	3.33	25.65
1700-1800	27.0	16.0	0.0	0.0	0.0	0.0	43.0	31.0	-2.1	16.8	25.2	4.8	25.86	3.58	23.47
1800-1900	17.1	12.0	0.0	0.0	0.0	0.0	29.1	27.0	-0.0	20.6	22.1	8.1	10.51	3.73	24.86
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	-0.0	3.9	1.2	.3	8.95	2.97	12.45
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.00	0.00	0.00
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.00	0.00	0.00
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.00	0.00	0.00
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.00	0.00	0.00
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.00	0.00	0.00

## AVERAGE DELAYS

TIME	ARRIVALS			DEPARTURES			TOT	RWY TAXI IN	AVERAGE DELAYS		
	RWY 9R	RWY 9L	RWY 12	RWY 9R	RWY 9L	RWY 12	CRS		ARR	DEP	GRAND TOTAL
1100-1200	2.5	1.4	0.0	0.0	0.0	0.0	2.0	.0	2.0	2.4	2.0
1200-1300	5.0	4.8	0.0	0.0	0.0	0.0	4.9	.2	5.1	11.5	5.1
1300-1400	35.6	0.0	0.0	0.0	0.0	0.0	35.6	.0	36.4	12.0	36.4
1400-1500	61.2	55.6	0.0	0.0	0.0	0.0	58.5	.1	59.5	46.9	59.5
1500-1600	51.1	14.1	0.0	0.0	0.0	0.0	32.3	.0	32.7	27.2	32.7
1600-1700	43.8	2.9	0.0	0.0	0.0	0.0	27.9	.0	28.2	21.3	28.2
1700-1800	24.7	2.3	0.0	0.0	0.0	0.0	16.4	.0	17.0	19.0	17.0
1800-1900	1.2	.8	0.0	0.0	0.0	0.0	1.1	.1	1.5	20.1	1.5
1900-2000	0.0	.4	0.0	0.0	0.0	0.0	.4	.0	.4	6.9	.4
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0

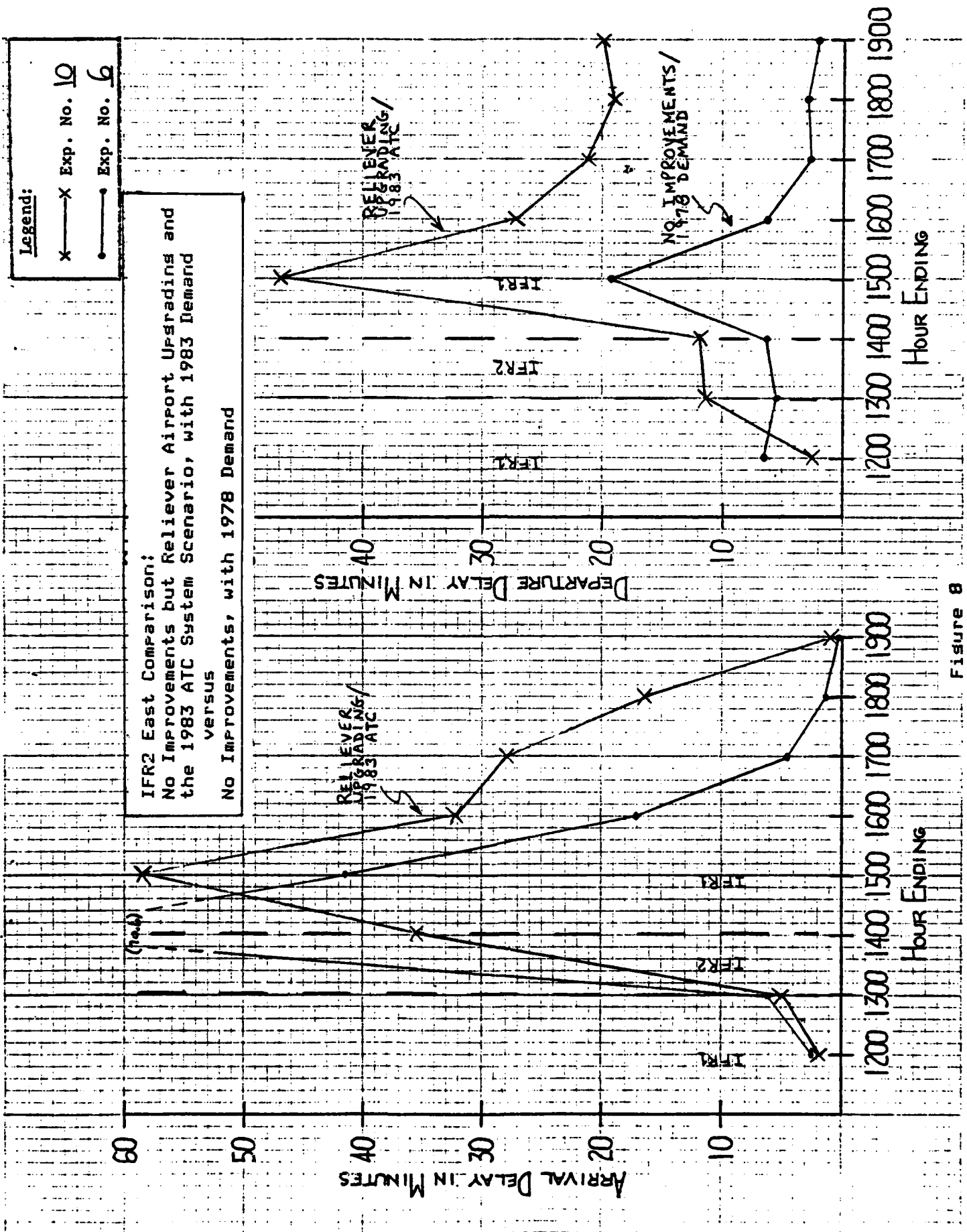


Figure 8

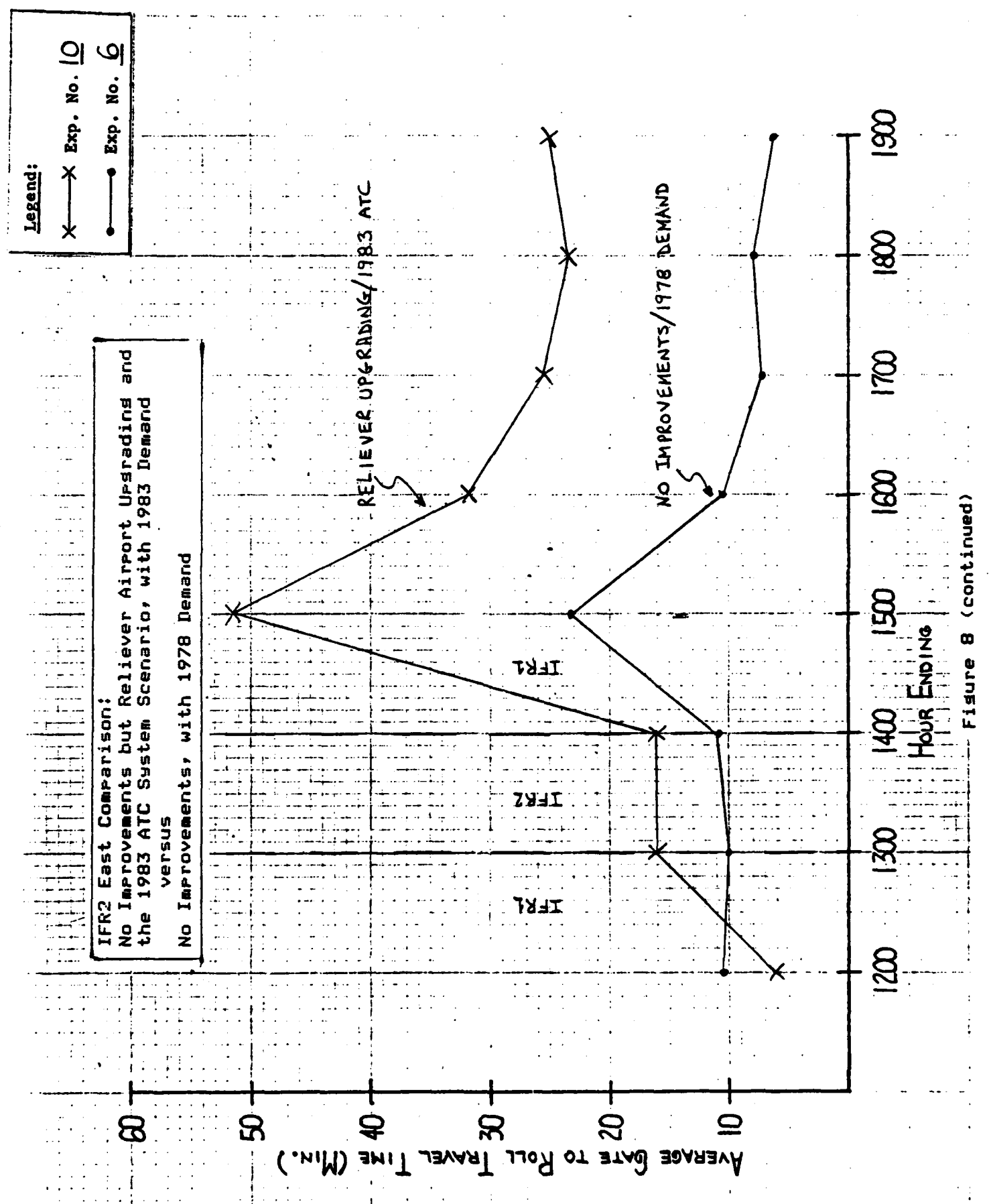


Figure 8 (continued)

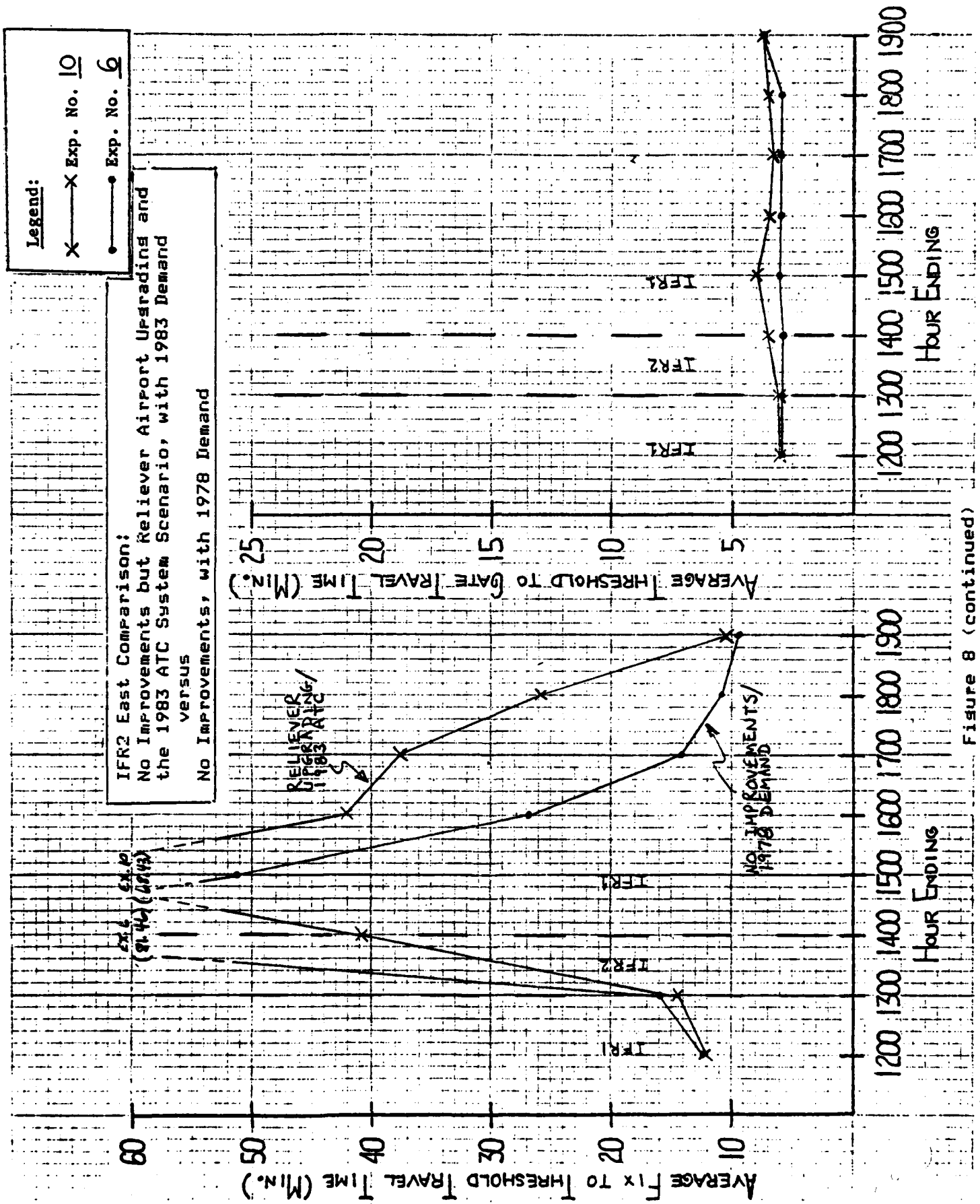


Figure 8 (continued)

## EXPERIMENT NO. 21

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR2 conditions, assuming the improved (1983) ATC system scenario and all Miami improvements including a 50-percent reduction in G.A. traffic due to Reliever Airport upgradings:

#### Arrival Runways

9L,9R

#### Departure Runways

9L,9R,12

### Related Comparison Experiments:

Prior experiment 10 serves as the basis for comparison to this experiment, wherein the Miami-specific improvements were not included.

(An IFR1/IFR2/IFR1 situation was also used in this experiment, in order to allow direct comparison to experiment No. 10.)

IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.

IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 16

## EXPERIMENT 21 RESULTS

MIAMI INTER. AIRPORT EXPER.-21 ROUTES-1983 CONFIG-A SEPAR-83IFR1-IFR2 DEMAND-83  
AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				AVERAGE TRAVEL TIMES			
	9R	9L	12	RWY	9R	9L	12	RWY	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL	
1100-1200	25.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	12.35	2.88	5.66	
1200-1300	28.3	21.0	0.0	0.0	0.0	0.0	0.0	0.0	14.37	2.71	15.68	
1300-1400	27.7	17.0	0.0	0.0	0.0	0.0	0.0	0.0	13.80	3.12	16.12	
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	11.31	5.45	43.26	
1500-1600	25.0	25.3	0.0	0.0	0.0	0.0	0.0	0.0	12.57	4.10	56.13	
1600-1700	24.0	19.7	0.0	0.0	0.0	0.0	0.0	0.0	15.02	5.85	62.33	
1700-1800	13.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	10.80	3.90	78.46	
1800-1900	17.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	10.32	3.21	63.10	
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	9.17	2.71	117.23	
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
GRAND TOTAL												
AVERAGE DELAYS												
ARRIVALS				DEPARTURES				AVERAGE DELAYS				
9R	9L	12	RWY	9R	9L	12	RWY	ARR	DEP	DELAY	DELAY	
1100-1200	2.5	1.3	0.0	0.0	5.8	1.3	3.4	0.0	0.0	2.0	2.3	
1200-1300	5.0	4.7	0.0	0.0	26.3	4.7	6.6	0.0	0.0	4.9	11.5	
1300-1400	5.4	1.1	0.0	0.0	63.4	3.4	5.8	0.0	0.0	3.9	12.6	
1400-1500	2.6	.3	0.0	0.0	85.4	1.9	26.2	0.0	0.0	4.4	39.1	
1500-1600	2.0	3.3	0.0	0.0	91.5	4.2	19.0	0.0	0.0	3.8	52.2	
1600-1700	7.4	2.4	0.0	0.0	118.3	3.3	15.4	0.0	0.0	8.1	58.3	
1700-1800	1.0	1.9	0.0	0.0	82.1	6.7	7.3	0.0	0.0	2.8	74.0	
1800-1900	.9	.8	0.0	0.0	60.4	2.4	9.3	0.0	0.0	.9	58.7	
1900-2000	0.0	.7	0.0	0.0	38.3	0.0	2.3	0.0	0.0	.7	111.7	
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	



TABLE 16.1

## EXPERIMENT 21M RESULTS

MIAMI INTER. AIRPORT EXPER. -21M ROUTES-1983 CONFIG-A SEPAR-83IFR1-IFR2 DEMAND-83  
AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				AVERAGE DELAYS				AVERAGE TRAVEL TIMES						
	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	ARR DELAY	DEP DELAY	FIX TO THRESH	THRESH TO GATE	THRESH TO ROLL	DATE TO ROLL	
1100-1200	24.5	21.9	0.0	0.0	0.0	0.0	0.0	46.4	52.0	-5.6	2.7	11.7	2.8	0.0	0.0	0.0	17.2	19.0	-1.8
1200-1300	29.5	21.1	0.0	0.0	0.0	0.0	0.0	50.6	47.0	-2.0	15.0	20.3	2.8	0.0	0.0	0.0	38.1	50.0	-13.7
1300-1400	27.0	17.0	0.0	0.0	0.0	0.0	0.0	44.0	44.0	-2.0	15.0	26.0	4.5	0.0	0.0	0.0	45.5	56.0	-24.2
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	0.0	40.0	38.0	-0.0	19.3	11.5	3.4	0.0	0.0	0.0	34.2	32.0	-22.0
1500-1600	25.0	26.0	0.0	0.0	0.0	0.0	0.0	51.0	60.0	-9.0	17.1	15.2	6.4	0.0	0.0	0.0	38.7	31.0	-14.3
1600-1700	24.0	19.0	0.0	0.0	0.0	0.0	0.0	45.0	34.0	-0.0	19.5	20.3	3.6	0.0	0.0	0.0	43.4	34.0	-4.9
1700-1800	13.8	16.0	0.0	0.0	0.0	0.0	0.0	28.8	31.0	-1.2	22.0	24.0	6.1	0.0	0.0	0.0	52.1	59.0	-11.8
1800-1900	16.2	12.0	0.0	0.0	0.0	0.0	0.0	28.2	27.0	-0.0	15.4	20.0	7.2	0.0	0.0	0.0	42.6	34.0	-3.2
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	-0.0	3.0	0.0	0.2	0.0	0.0	0.0	3.2	0.0	-0.0
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
GRAND TOTAL																			
TIME	ARRIVALS				DEPARTURES				AVERAGE DELAYS				AVERAGE DELAYS						
	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	RWY 9R	RWY 12	RWY 9L	RWY 12	ARR DELAY	DEP DELAY	ARR DELAY	DEP DELAY	ARR DELAY	DEP DELAY	
1100-1200	2.6	1.2	0.0	0.0	0.0	0.0	0.0	1.9	2.4	1.6	4.5	0.0	1.9	2.2	1.9	2.2	1.9	2.2	
1200-1300	5.0	4.7	0.0	0.0	0.0	0.0	0.0	4.9	18.9	4.7	8.8	0.0	4.9	10.8	4.9	10.8	4.9	10.8	
1300-1400	5.3	1.2	0.0	0.0	0.0	0.0	0.0	3.7	37.0	3.3	15.9	0.0	3.8	17.2	3.8	17.2	3.8	17.2	
1400-1500	2.7	.4	0.0	0.0	0.0	0.0	0.0	1.9	39.3	1.6	41.3	0.0	2.0	36.2	2.0	36.2	2.0	36.2	
1500-1600	2.2	3.4	0.0	0.0	0.0	0.0	0.0	2.8	38.2	4.3	41.9	0.0	2.8	38.9	2.8	38.9	2.8	38.9	
1600-1700	7.0	2.1	0.0	0.0	0.0	0.0	0.0	5.0	32.9	3.4	42.7	0.0	5.0	25.2	5.0	25.2	5.0	25.2	
1700-1800	.9	1.9	0.0	0.0	0.0	0.0	0.0	1.4	6.8	7.5	11.5	0.0	1.5	8.8	1.5	8.8	1.5	8.8	
1800-1900	.4	.9	0.0	0.0	0.0	0.0	0.0	.6	8.1	2.1	18.7	0.0	.7	7.2	.7	7.2	.7	7.2	
1900-2000	0.0	.4	0.0	0.0	0.0	0.0	0.0	.4	3.2	0.0	1.2	0.0	.4	3.5	.4	3.5	.4	3.5	
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

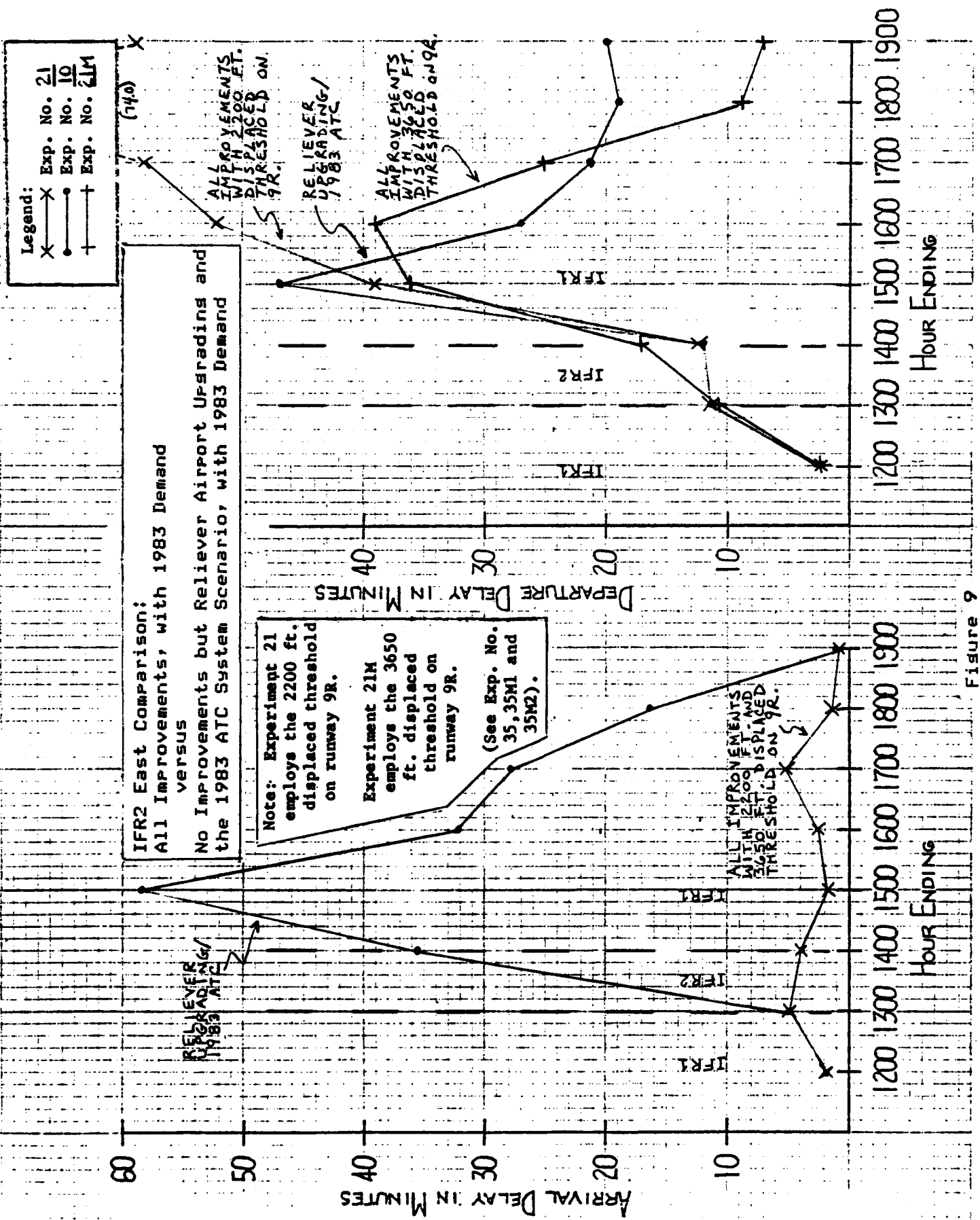


Figure 9

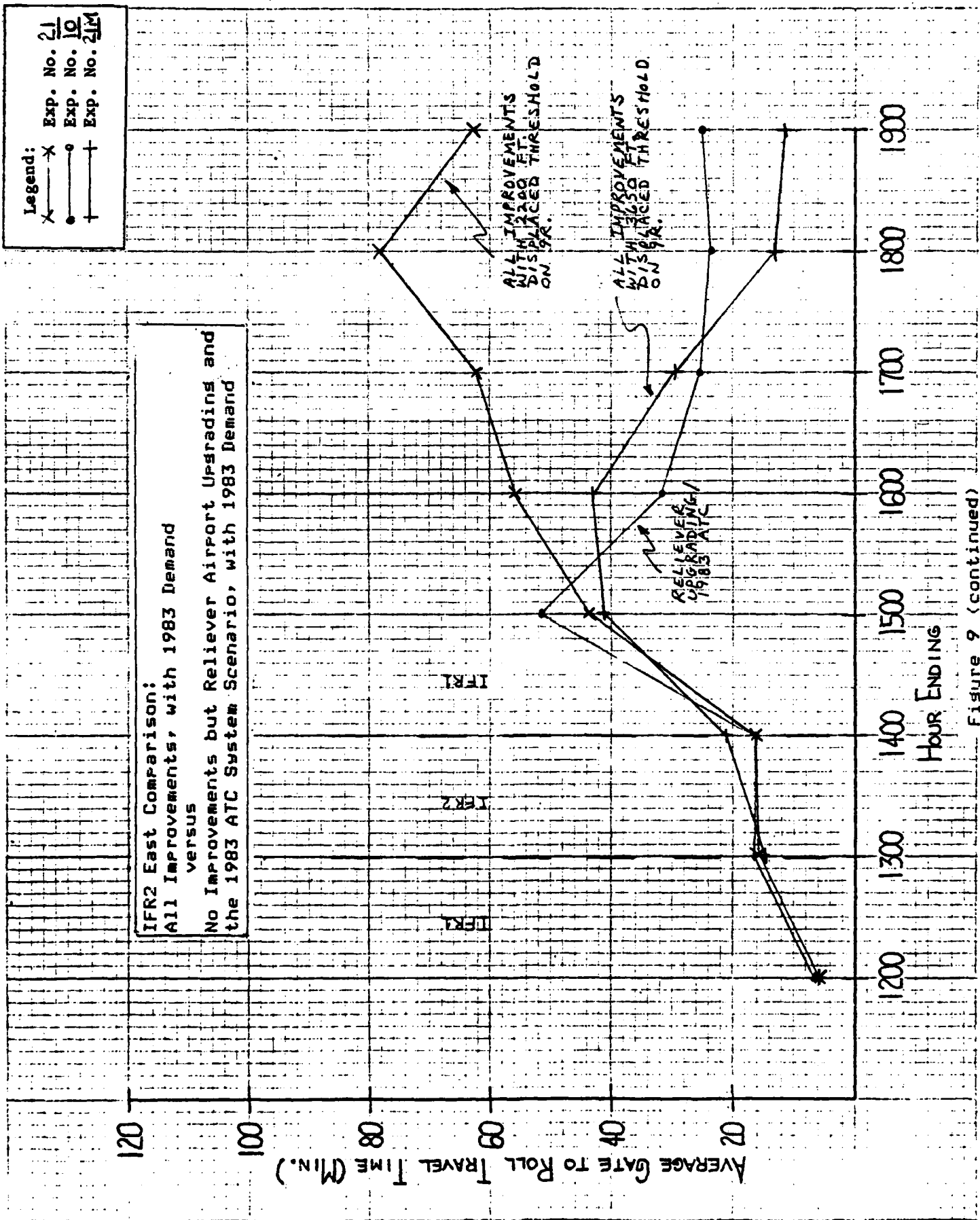


Figure 9 (continued)

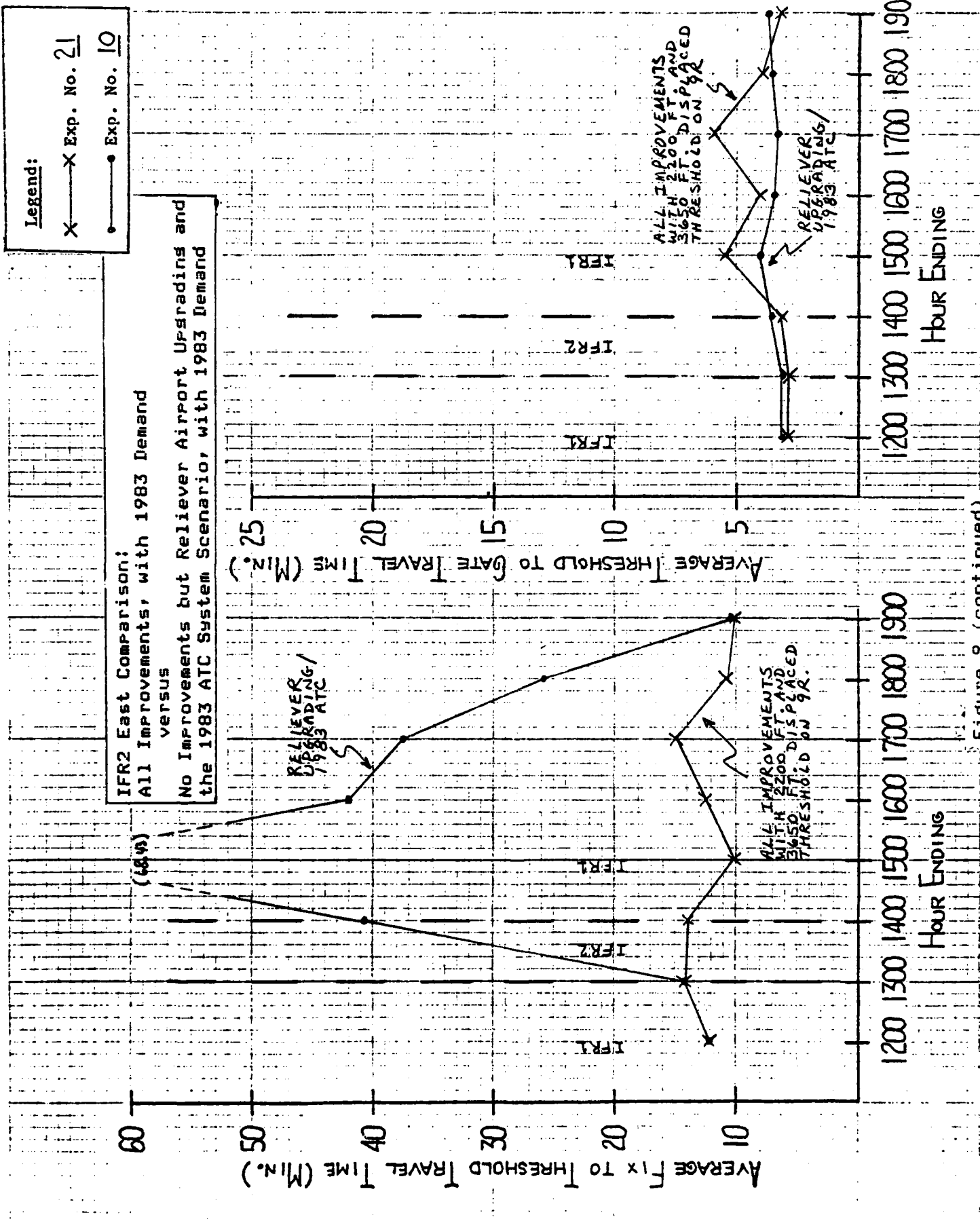


Figure 9 (continued)

TABLE 17  
SET 3 DEMAND  
VFR, WESTERLY FLOW

EXPERIMENT NUMBER		RUNWAY 27R	RUNWAY 27L	RUNWAY 30	TOTAL
40	ARRIVALS	239	156	0	395
	DEPARTURES	198	172	0	370
	TOTAL	437	328	0	765
36 (8)	ARRIVALS	192	31	172	395
	DEPARTURES	195	172	3	370
	TOTAL	387	203	175	765
37	ARRIVALS	166	30	158	354
	DEPARTURES	167	160	2	329
	TOTAL	333	190	160	683
17	ARRIVALS	212	142	0	354
	DEPARTURES	167	160	2	329
	TOTAL	379	302	2	683
12 AND 12A	ARRIVALS	165	0	189	354
	DEPARTURES	167	162	0	329
	TOTAL	332	162	189	683
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				

## EXPERIMENT NO. 40

### Objective:

To assess delays to aircraft in 1978 for the following runway configuration under VFR1 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

27L, 27R

Departure Runways

27L, 27R

### Related Comparison Experiments:

Prior experiment 8 (Data Package No. 5) serves as the basis for comparison to this experiment, wherein the conditions of this study case were identical except for the use of runway 30.

VFR1- Ceiling above 1500 ft. and visibility over 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

## EXPERIMENT 40 RESULTS

TIME	ARRIVALS			DEPARTURES			FIX TO THRESH			AVERAGE TRAVEL			TIMES TO		
	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	
1100-1200	23.3	23.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1200-1300	28.2	20.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1300-1400	27.2	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1400-1500	26.2	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1500-1600	27.5	26.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1600-1700	27.0	19.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1700-1800	26.1	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1800-1900	28.3	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1900-2000	25.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AVERAGE DELAYS															
	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	
	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	16.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	38.5	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	54.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	51.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	55.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	78.7	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	70.8	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	65.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AVERAGE DELAYS															
	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	
	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	16.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	38.5	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	54.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	51.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	55.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	78.7	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	70.8	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	65.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AVERAGE DELAYS															
	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L	RWY 30	RWY 27L								

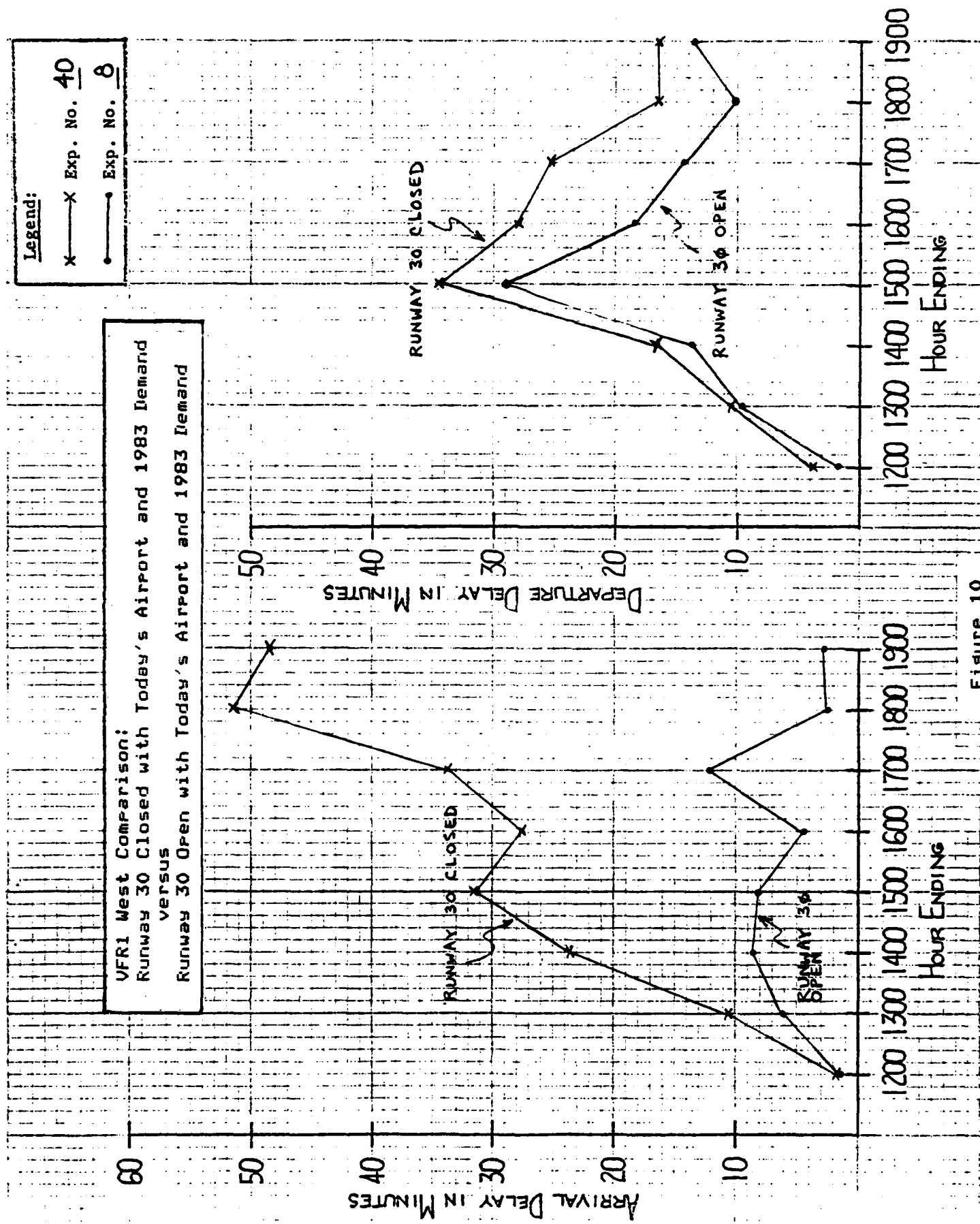


Figure 10



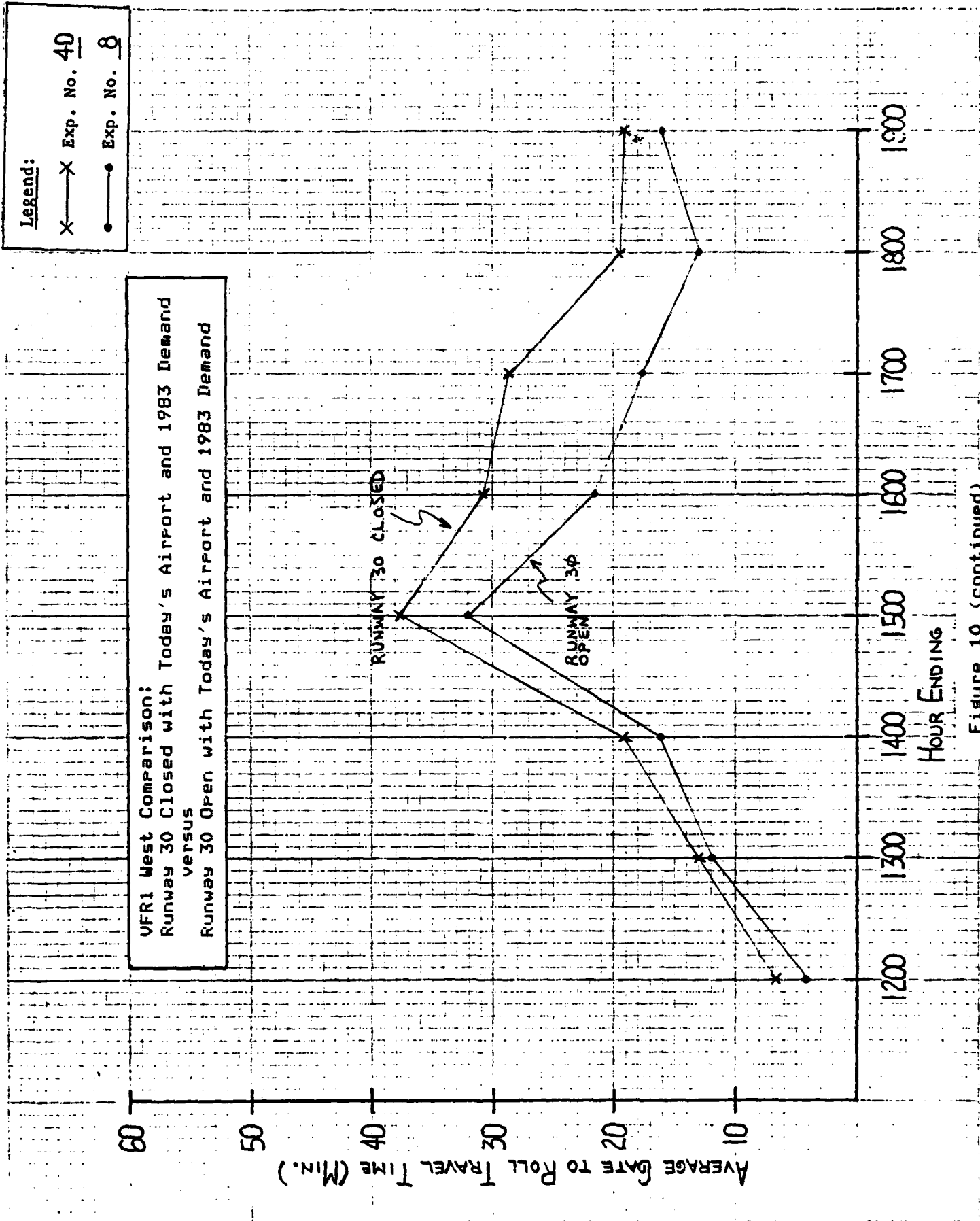
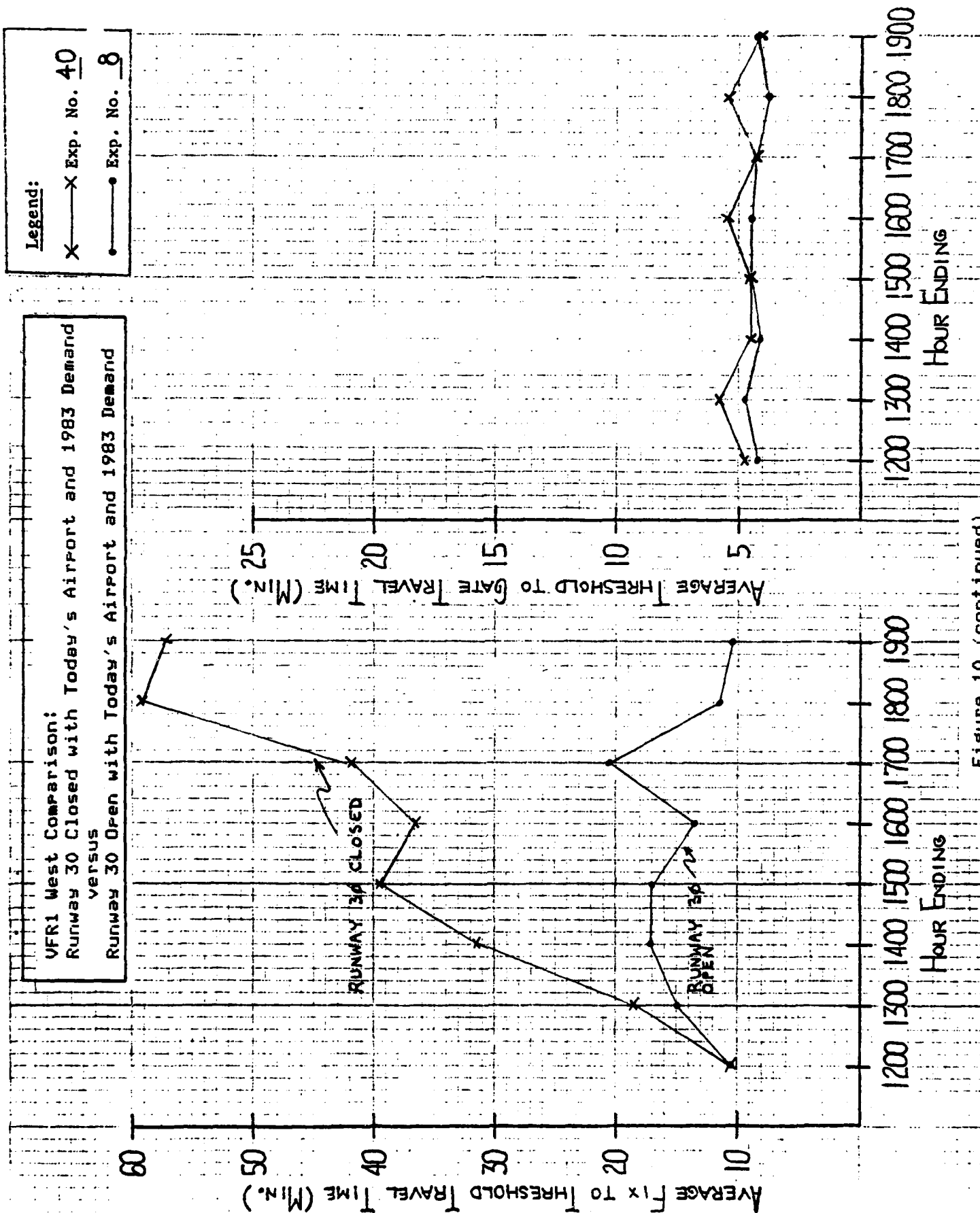


Figure 10 (continued)



## EXPERIMENT NO. 36

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami near-term improvements except for Reliever Airport upgrading:

#### Arrival Runways

27L, 27R, 30

#### Departure Runways

27L, 27R, 30

### Related Comparison Experiments:

Prior experiment 8 (Data Package No. 5) serves as the 1983 demand level baseline for comparison to this experiment. Experiment 37 assesses the expected delays after reducing the G.A. traffic of this study case by 50-percent.

VFR1- Ceiling above 1500 ft. and visibility over 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 19

## EXPERIMENT 36 RESULTS

MIAMI INTER. AIRPORT EXPR.-36 ROUTES=1983 CONFIG=B SEPAR=BSVFR1 DEMAND=83

## AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				DIF	AVERAGE TRAVEL TIMES			
	RWY 27R	RWY 27L	RWY 30	RWY 30	RWY 27R	RWY 27L	RWY 30	RWY 30		FIX TO THRESH	THRESH TO GATE	GATE TO ROLL	
1100-1200	23.0	5.3	23.8	0.0	0.0	0.0	0.0	0.0	-2.9	10.6	7.0	0.0	10.12
1200-1300	31.6	5.7	23.2	0.0	0.0	0.0	0.0	0.0	-4.4	22.9	32.7	1.0	11.52
1300-1400	27.4	3.0	18.0	0.0	0.0	0.0	0.0	0.0	-4.0	28.6	30.2	1.0	13.85
1400-1500	21.0	5.2	21.0	0.0	0.0	0.0	0.0	0.0	-8.8	33.6	13.1	0.0	11.98
1500-1600	26.0	3.8	30.1	0.0	0.0	0.0	0.0	0.0	-11.9	21.2	22.8	0.0	11.69
1600-1700	23.0	4.0	22.9	0.0	0.0	0.0	0.0	0.0	-0.0	23.1	12.2	1.0	15.52
1700-1800	24.1	2.0	16.0	0.0	0.0	0.0	0.0	0.0	-3.9	30.1	35.0	0.0	10.91
1800-1900	15.5	2.0	15.0	0.0	0.0	0.0	0.0	0.0	-2.0	24.9	19.0	0.0	9.47
1900-2000	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	11.69
													3.27
													0.00

## AVERAGE DELAYS

TIME	ARRIVALS				DEPARTURES				DIF	AVERAGE DELAYS			
	RWY 27R	RWY 27L	RWY 30	RWY 30	RWY 27R	RWY 27L	RWY 30	RWY 30		ARR	DEP	DEL	
1100-1200	.6	1.8	.9	0.0	0.0	0.0	0.0	0.0	.9	.9	1.9	1.9	
1200-1300	3.6	3.0	1.5	0.0	0.0	0.0	0.0	0.0	.2	2.9	8.5	8.5	
1300-1400	8.5	.7	.7	0.0	0.0	0.0	0.0	0.0	.0	5.1	11.5	11.5	
1400-1500	5.8	.8	.7	0.0	0.0	0.0	0.0	0.0	.1	3.1	17.9	17.9	
1500-1600	2.1	1.6	3.5	0.0	0.0	0.0	0.0	0.0	.0	2.9	3.9	3.9	
1600-1700	1.3	5.1	12.8	0.0	0.0	0.0	0.0	0.0	.0	6.9	3.4	3.4	
1700-1800	2.5	.7	.8	0.0	0.0	0.0	0.0	0.0	.0	1.8	7.0	7.0	
1800-1900	2.3	1.4	.8	0.0	0.0	0.0	0.0	0.0	.0	1.6	.6.5	.6.5	
1900-2000	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	.0	2.2	0.0	0.0	

## GRAND TOTAL

ARRIVALS				DEPARTURES				DIF	AVERAGE DELAYS			
RWY 27R	RWY 27L	RWY 30	RWY 30	RWY 27R	RWY 27L	RWY 30	RWY 30		ARR	DEP	DEL	
11.69	3.27	0.00	0.00	11.69	3.27	0.00	0.00	-0.00	2.2	0.0	0.0	

VFR1 West Comparison:  
 All Improvements but Reliever Airport Upgradings,  
 with 1983 Demand  
 versus  
 No Improvements, with 1983 Demand

Legend:  
 X — Exp. No. 36  
 • — Exp. No. 8

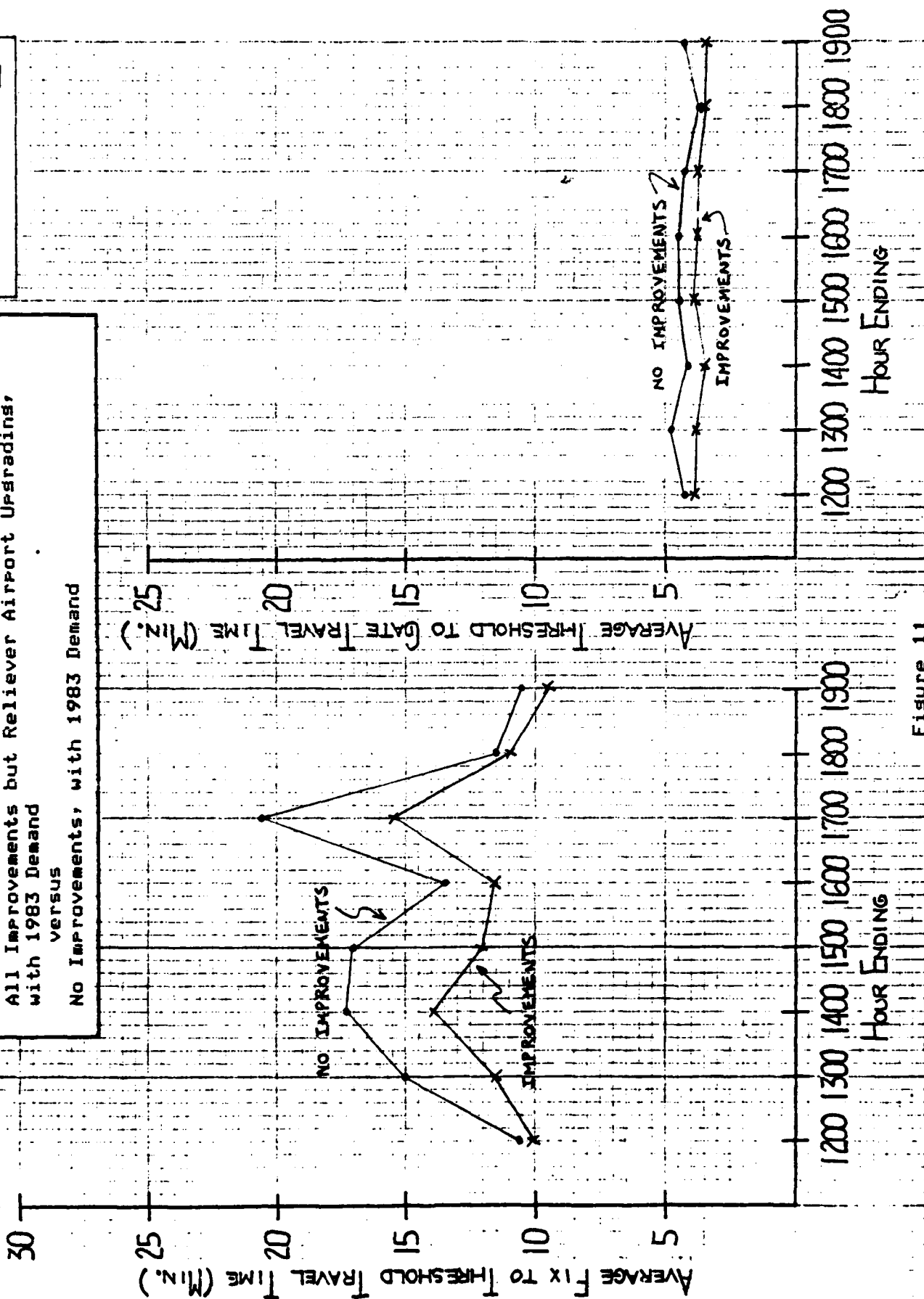


Figure 11

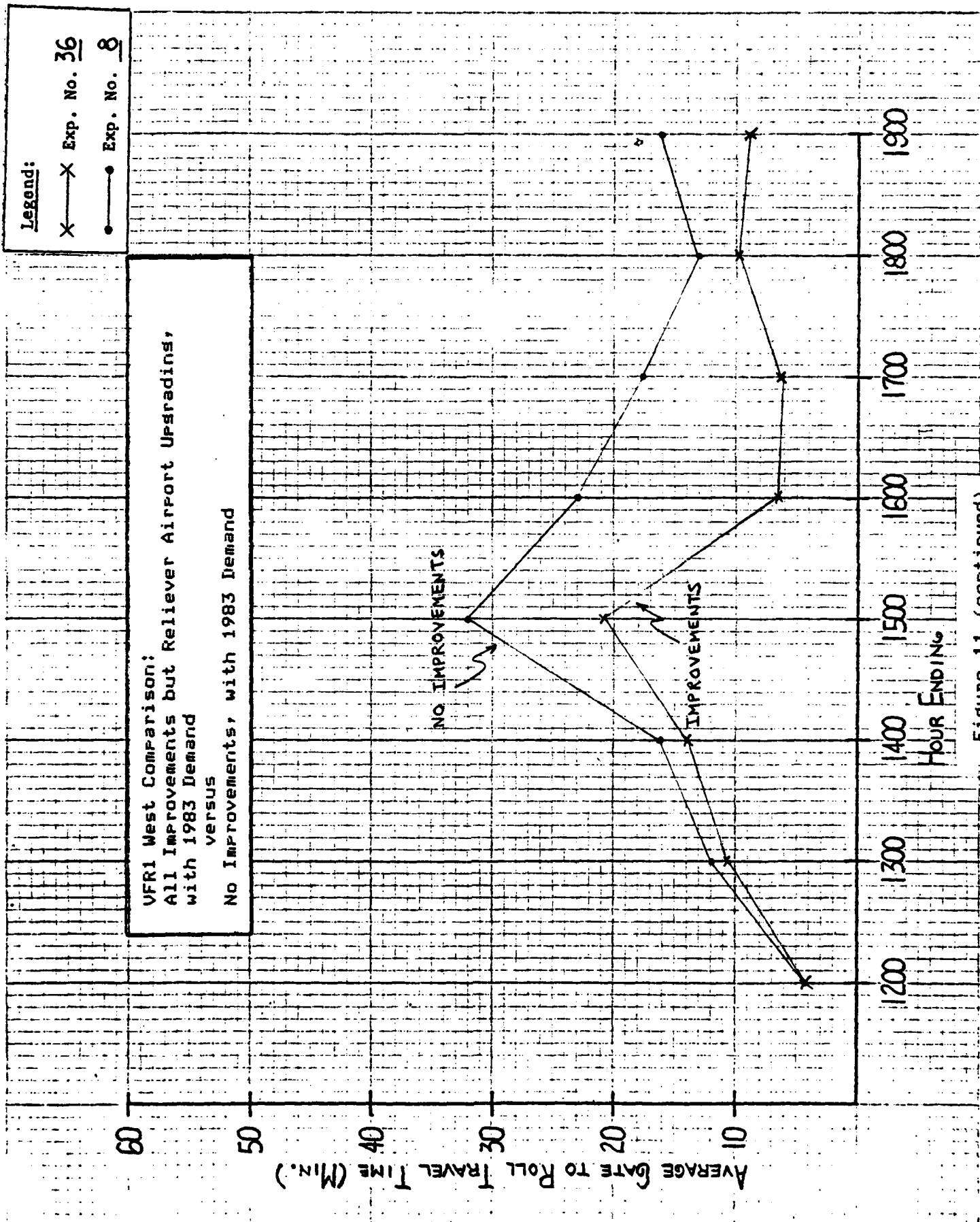


Figure 11 (continued)

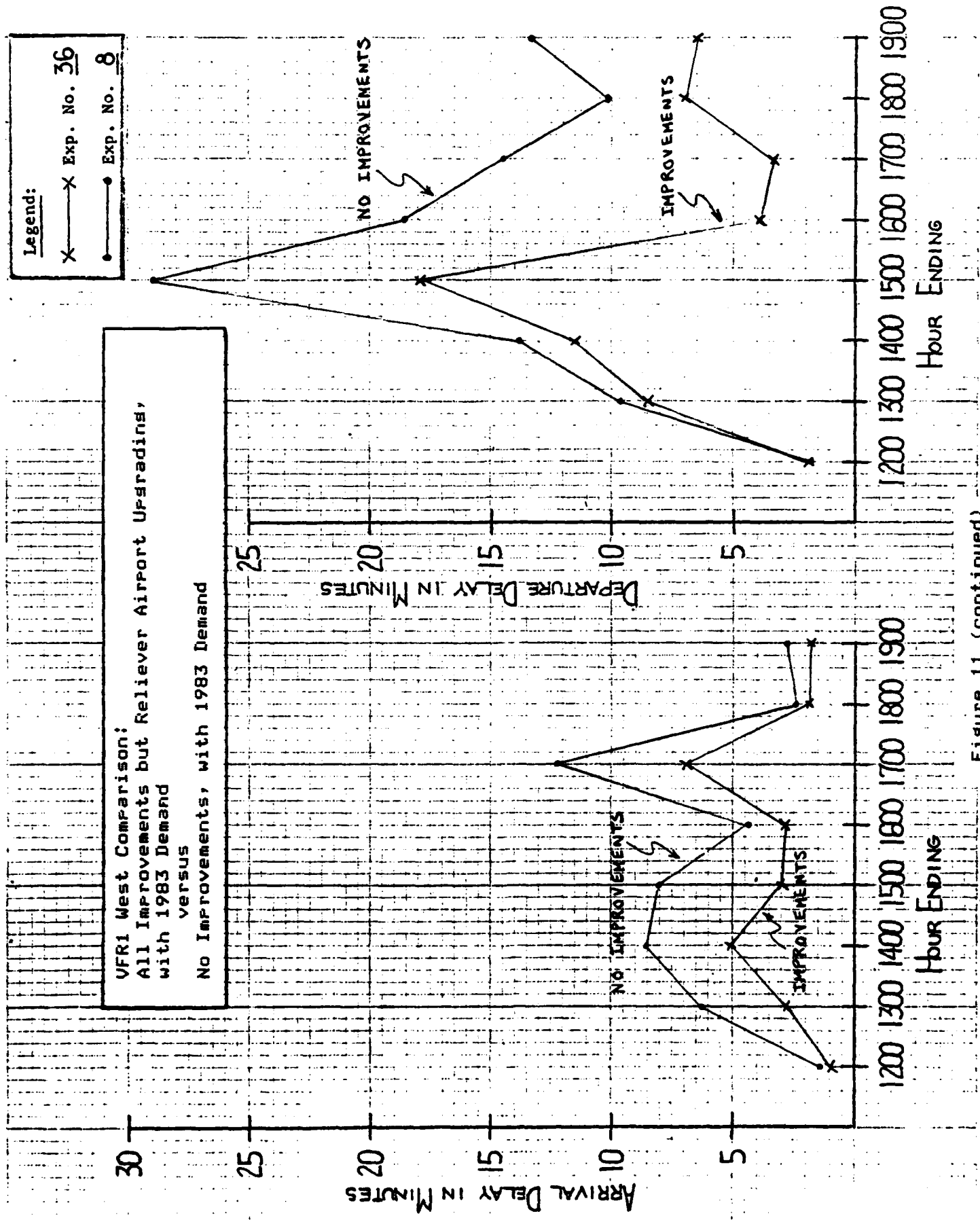


Figure 11 (continued)

## EXPERIMENT NO. 37

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami improvements including a 50-percent reduction in G.A. traffic due to Relievert Airport upgradings:

Arrival Runways

27L, 27R, 30

Departure Runways

27L, 27R, 30

### Related Comparison Experiments:

Prior experiment 36 serves as the basis for comparison to this experiment, wherein the conditions of this study case were identical except for the 50-percent reduction in G.A. traffic due to the upgradings of Ops Locks and Tamiami.

VFR1- Ceiling above 1500 ft. and visibility over 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980



TABLE 20

## EXPERIMENT 37 RESULTS

MIAMI INTER. AIRPORT EXPER.-37 ROUTES=1983 CONFIG=B SEPAR=83VFR1 DEMAND=83

## AVERAGE FLOW RATES

TIME	ARRIVALS					DEPARTURES					DIF		AVERAGE TRAVEL TIMES TO				
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT DE-	TOT DE-	THRESH TO GATE	FIX TO THRESH	ROLL	
1100-1200	19.8	4.0	23.9	0.0	0.0	0.0	15.0	6.0	0.0	0.0	0.0	0.0	21.0	21.0	-11.25	4.11	4.36
1200-1300	28.2	3.0	25.3	0.0	0.0	0.0	21.6	30.0	0.0	0.0	0.0	0.0	51.6	52.0	11.61	3.88	6.92
1300-1400	21.0	4.0	17.8	0.0	0.0	0.0	29.1	26.0	0.0	0.0	0.0	0.0	55.1	57.0	10.15	3.96	6.24
1400-1500	26.5	1.0	15.0	0.0	0.0	0.0	19.3	15.0	0.0	0.0	0.0	0.0	34.3	33.0	11.15	3.67	6.28
1500-1600	27.6	5.0	22.3	0.0	0.0	0.0	15.2	18.0	1.0	0.0	0.0	0.0	34.2	34.0	11.35	3.86	5.04
1600-1700	19.9	3.0	20.7	0.0	0.0	0.0	20.8	13.8	1.0	0.0	0.0	0.0	35.6	35.0	11.05	3.89	5.76
1700-1800	12.0	5.0	17.0	0.0	0.0	0.0	25.0	34.0	0.0	0.0	0.0	0.0	59.0	62.0	9.92	3.69	6.45
1800-1900	11.0	5.0	15.0	0.0	0.0	0.0	21.0	17.2	0.0	0.0	0.0	0.0	38.2	35.0	9.75	3.87	4.29
1900-2000	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.50	3.14	0.00
GRAND TOTAL																	
TIME	ARRIVALS					DEPARTURES					DIF		AVERAGE DELAYS				
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT CRS	TOT CRS	ARR DELAY	DEP DELAY		
1100-1200	.9	1.9	2.2	0.0	0.0	0.0	2.0	1.1	0.0	0.0	0.0	0.0	1.8	.0	1.7	1.8	
1200-1300	1.5	2.2	3.1	0.0	0.0	0.0	7.5	2.4	0.0	0.0	0.0	0.0	4.5	.0	2.3	4.8	
1300-1400	.6	.7	.9	0.0	0.0	0.0	5.3	1.6	0.0	0.0	0.0	0.0	3.5	.0	.8	3.8	
1400-1500	2.2	0.0	1.1	0.0	0.0	0.0	5.6	.6	0.0	0.0	0.0	0.0	3.4	.0	1.8	3.5	
1500-1600	2.2	.8	2.2	0.0	0.0	0.0	3.0	1.6	1.7	0.0	0.0	0.0	2.3	.0	2.1	2.7	
1600-1700	1.8	.5	1.7	0.0	0.0	0.0	3.2	1.5	5.1	0.0	0.0	0.0	2.6	.0	1.8	2.8	
1700-1800	.0	.5	.7	0.0	0.0	0.0	2.1	4.7	0.0	0.0	0.0	0.0	3.6	.0	.5	4.0	
1800-1900	.3	.3	.8	0.0	0.0	0.0	1.7	1.3	0.0	0.0	0.0	0.0	1.5	.0	.5	1.9	
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	

VFR1 West Comparison:  
All Improvements, with 1983 Demand  
versus  
All Improvements but Reliever Airport Upgradings,  
with 1983 Demand

Arrival Delay in Minutes

Departure Delay in Minutes

Hour Ending

Hour Ending

Legend:

X Exp. No. 37

• Exp. No. 36

NO RELIEVER UPGRADING

RELIEVER UPGRADING

NO RELIEVER UPGRADING

RELIEVER UPGRADING

Figure 12

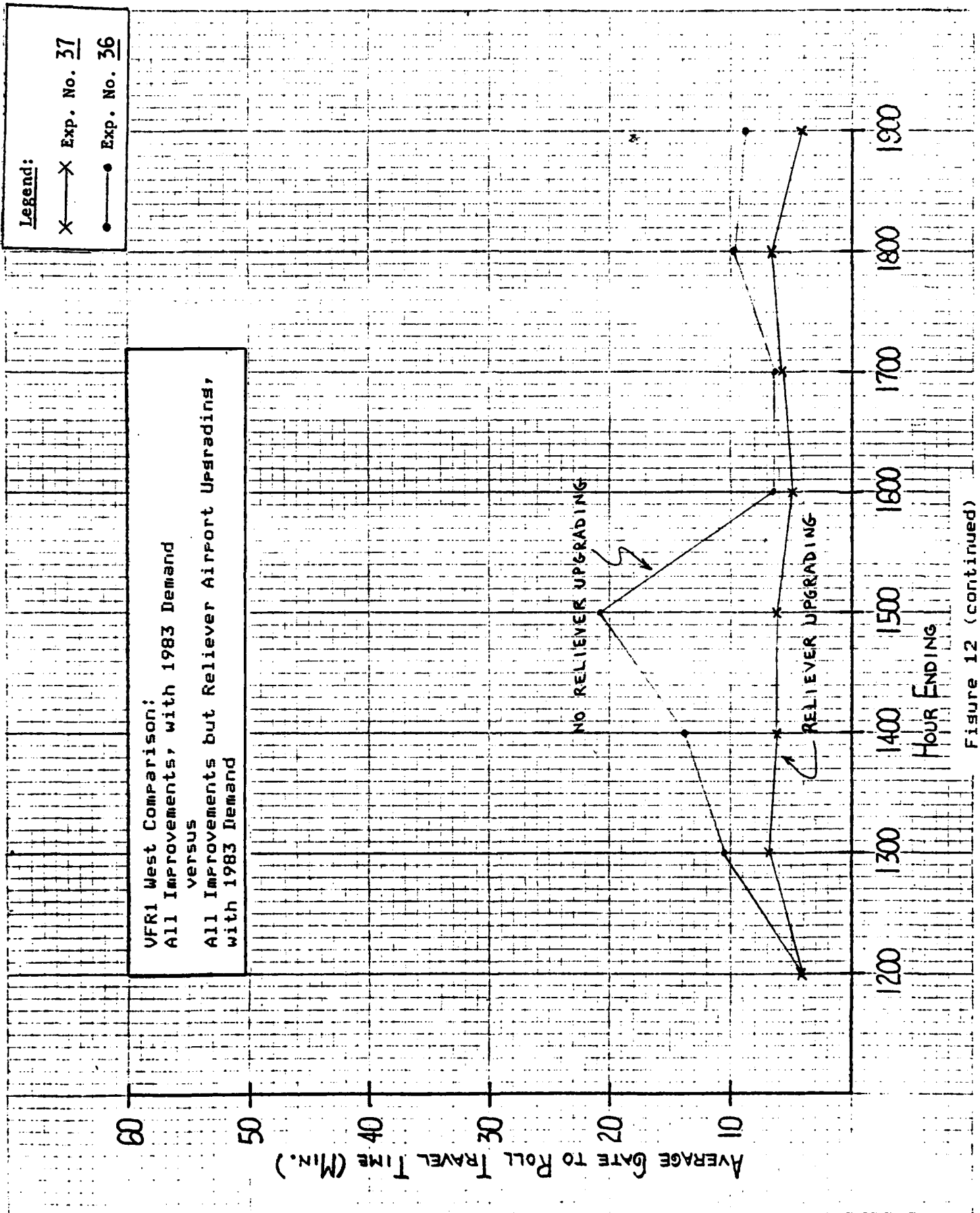


Figure 12 (continued)

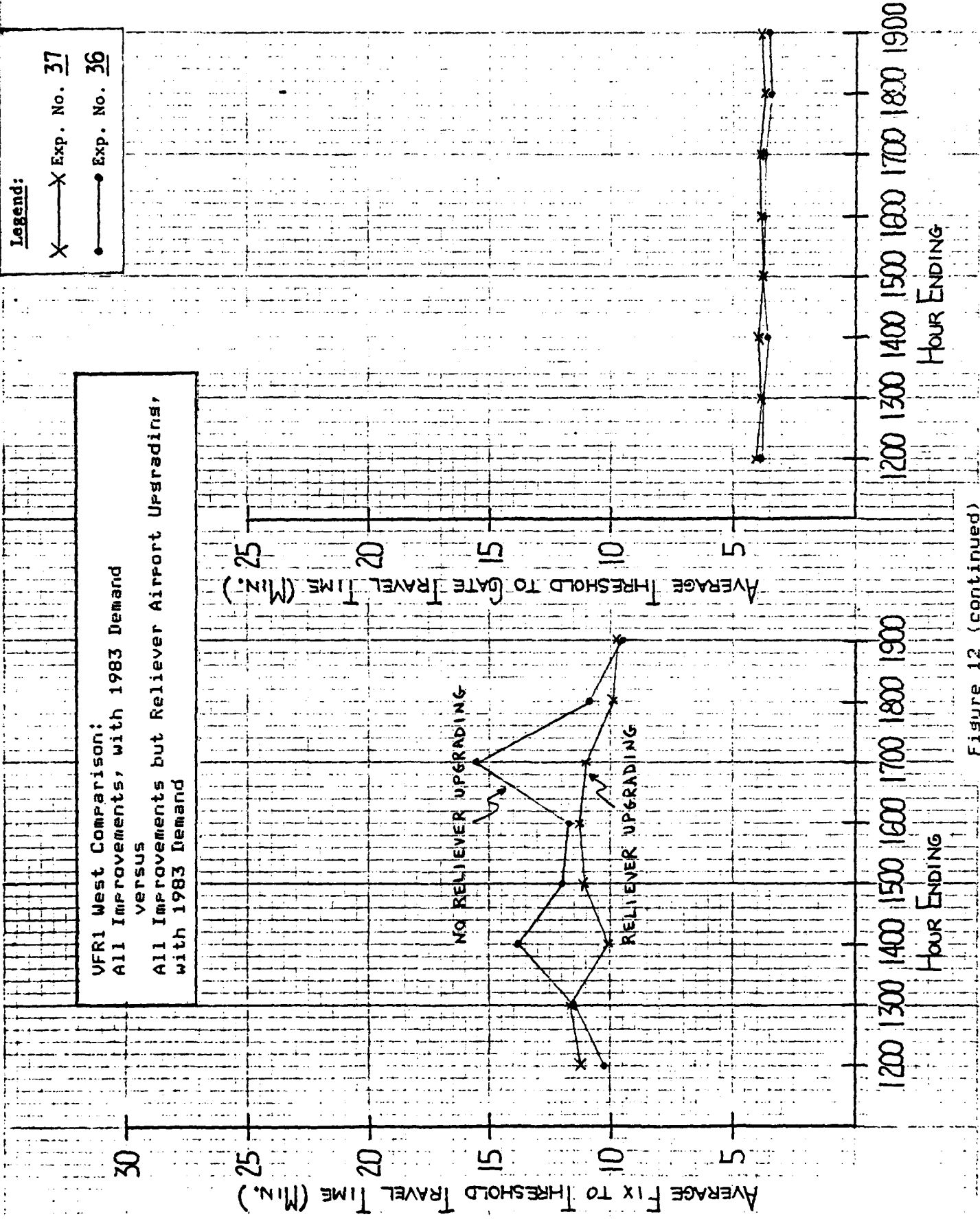


Figure 12 (continued)

## EXPERIMENT NO. 17

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR2 conditions, assuming the improved (1983) ATC system scenario and no Miami near-term improvements except for a 50-percent reduction in G.A. traffic due to Reliever Airport upgrading:

Arrival Runways

27L, 27R

Departure Runways

27L, 27R, 30

### Related Comparison Experiments:

Prior experiment 38 (Data Package No. 5) serves as the 1983 demand level baseline for comparison to this experiment. Experiment 12 assesses the expected delays after adding the Miami-specific improvements to this study case.

VFR2- Ceiling between 1000 ft. and 1500 ft. and  
visibility between 3 and 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 21  
EXPERIMENT 17 RESULTS

MIAMI INTER. AIRPORT EXPER.-17 ROUTES-1978 CONFIG-B SEPAR-83VFR1 DEMAND-83

TIME	ARRIVALS										DEPARTURES										AVERAGE FLOW RATES				AVERAGE TRAVEL TIMES TO			
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT DE-	DIF	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT DE-	DIF	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL											
1100-1200	27.0	17.3	0.0	0.0	0.0	0.0	44.3	54.0	-9.7	12.4	6.2	0.0	0.0	0.0	18.4	21.0	4.91											
1200-1300	32.9	25.7	0.0	0.0	0.0	0.0	58.6	49.0	-1.1	19.5	22.2	0.0	0.0	0.0	41.7	52.0	5.62											
1300-1400	27.1	17.0	0.0	0.0	0.0	0.0	44.1	45.0	-1.0	27.8	33.2	0.0	0.0	0.0	61.0	57.0	4.73											
1400-1500	26.0	18.0	0.0	0.0	0.0	0.0	1400	47.0	-4.0	24.0	15.6	0.0	0.0	0.0	39.6	33.0	4.91											
1500-1600	35.1	18.0	0.0	0.0	0.0	0.0	53.1	57.0	-7.9	14.9	17.1	1.0	0.0	0.0	33.0	34.0	5.11											
1600-1700	27.9	16.0	0.0	0.0	0.0	0.0	43.9	36.0	-7.0	21.9	14.8	1.0	0.0	0.0	37.7	35.0	4.40											
1700-1800	22.0	12.0	0.0	0.0	0.0	0.0	34.0	34.0	-0.0	24.9	32.7	0.0	0.0	0.0	57.6	62.0	4.17											
1800-1900	13.0	17.0	0.0	0.0	0.0	0.0	30.0	30.0	-0.0	18.2	17.9	0.0	0.0	0.0	36.1	35.0	5.46											
1900-2000	1.0	1.0	0.0	0.0	0.0	0.0	2.0	2.0	-0.0	3.4	.5	0.0	0.0	0.0	3.9	0.0	12.93											
AVERAGE DELAYS																		GRAND TOTAL										
TIME	ARRIVALS										DEPARTURES										AVERAGE DELAYS							
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	TAXI IN	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	CRS	TAXI OUT	ARR DELAY	DEP DELAY											
1100-1200	2.2	.4	0.0	0.0	0.0	0.0	.3	3.2	.5	0.0	0.0	0.0	0.0	2.3	.1	1.4	0.0											
1200-1300	11.8	1.4	0.0	0.0	0.0	0.0	.9	15.4	5.5	0.0	0.0	0.0	0.0	10.1	.0	2.5	.0											
1300-1400	1.7	.4	0.0	0.0	0.0	0.0	.4	13.2	4.6	0.0	0.0	0.0	0.0	8.5	.0	5.4	.5											
1400-1500	1.5	1.4	0.0	0.0	0.0	0.0	.4	14.5	1.3	0.0	0.0	0.0	0.0	9.3	.0	1.5	1.0											
1500-1600	2.9	.8	0.0	0.0	0.0	0.0	.9	5.8	2.7	.2	0.0	0.0	0.0	4.0	.1	1.8	.0											
1600-1700	5.6	.7	0.0	0.0	0.0	0.0	.2	8.3	2.7	1.5	0.0	0.0	0.0	5.9	.0	1.1	0.0											
1700-1800	.7	.5	0.0	0.0	0.0	0.0	.1	4.8	4.8	0.0	0.0	0.0	0.0	4.8	.0	1.2	0.0											
1800-1900	.4	.6	0.0	0.0	0.0	0.0	.6	2.4	1.1	0.0	0.0	0.0	0.0	1.8	.0	1.9	0.0											
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	.0	3.7	1.5	0.0	0.0	0.0	0.0	3.6	0.0	5.9	0.0											
																0.0		9.5										

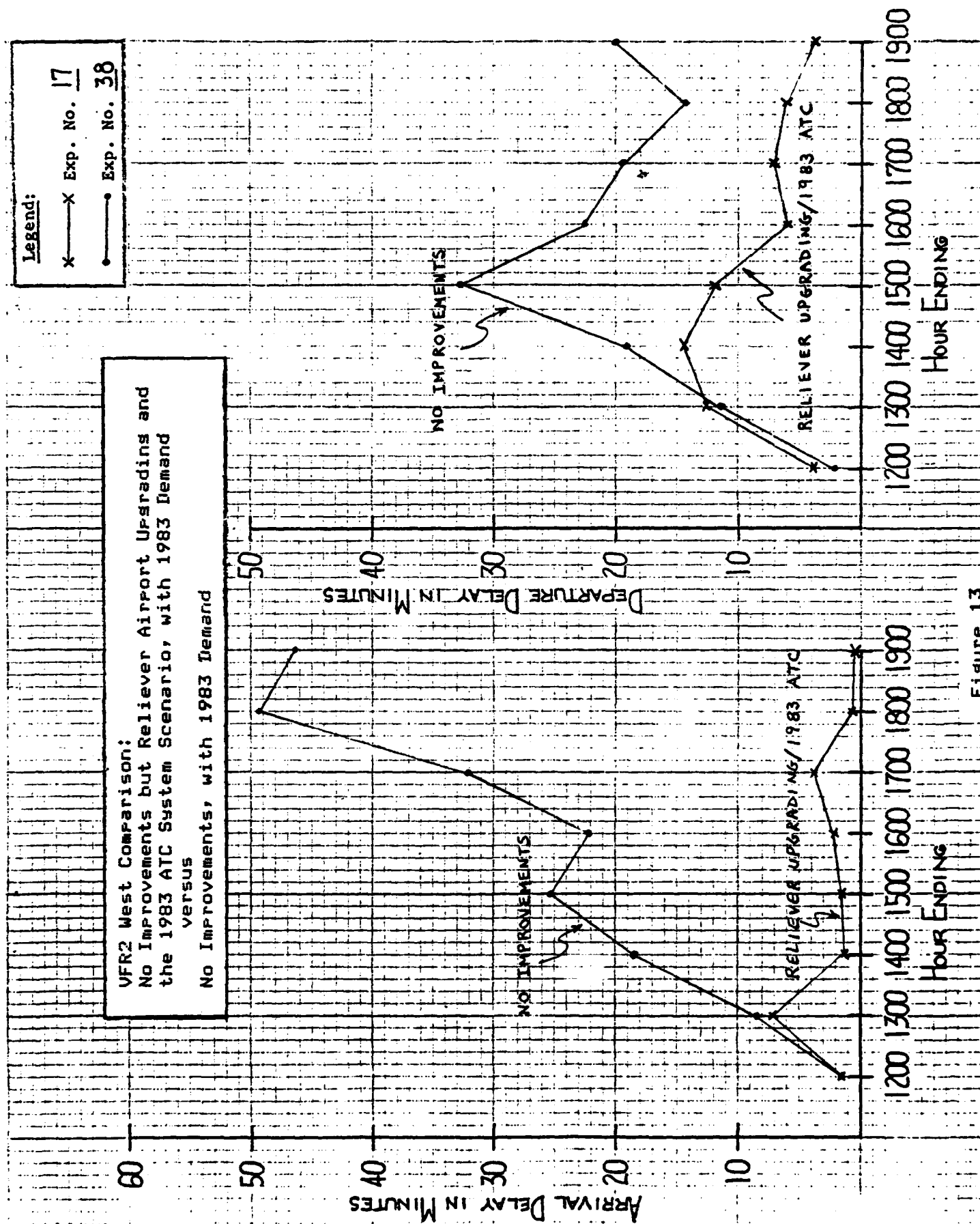


Figure 13

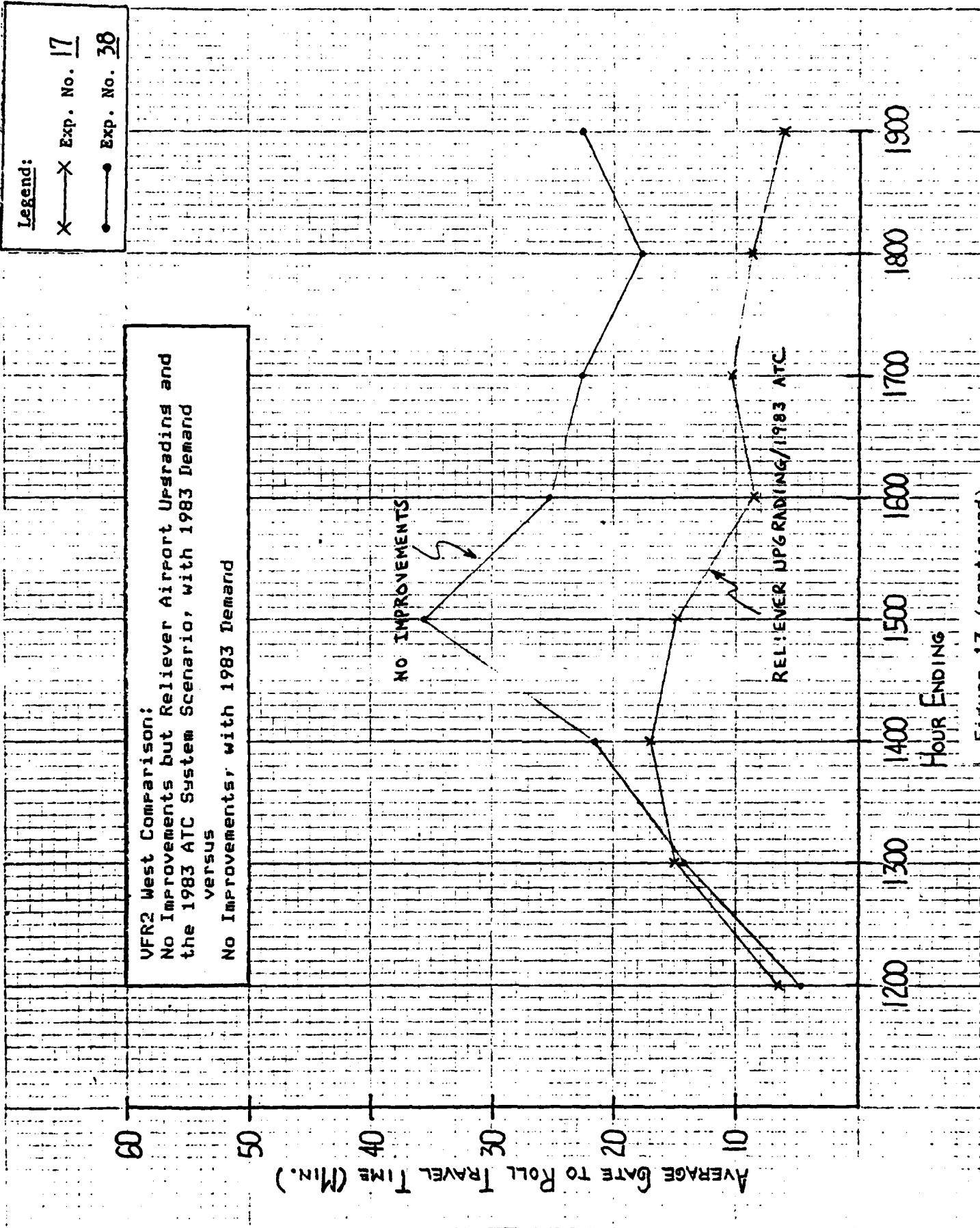


Figure 13 (continued)



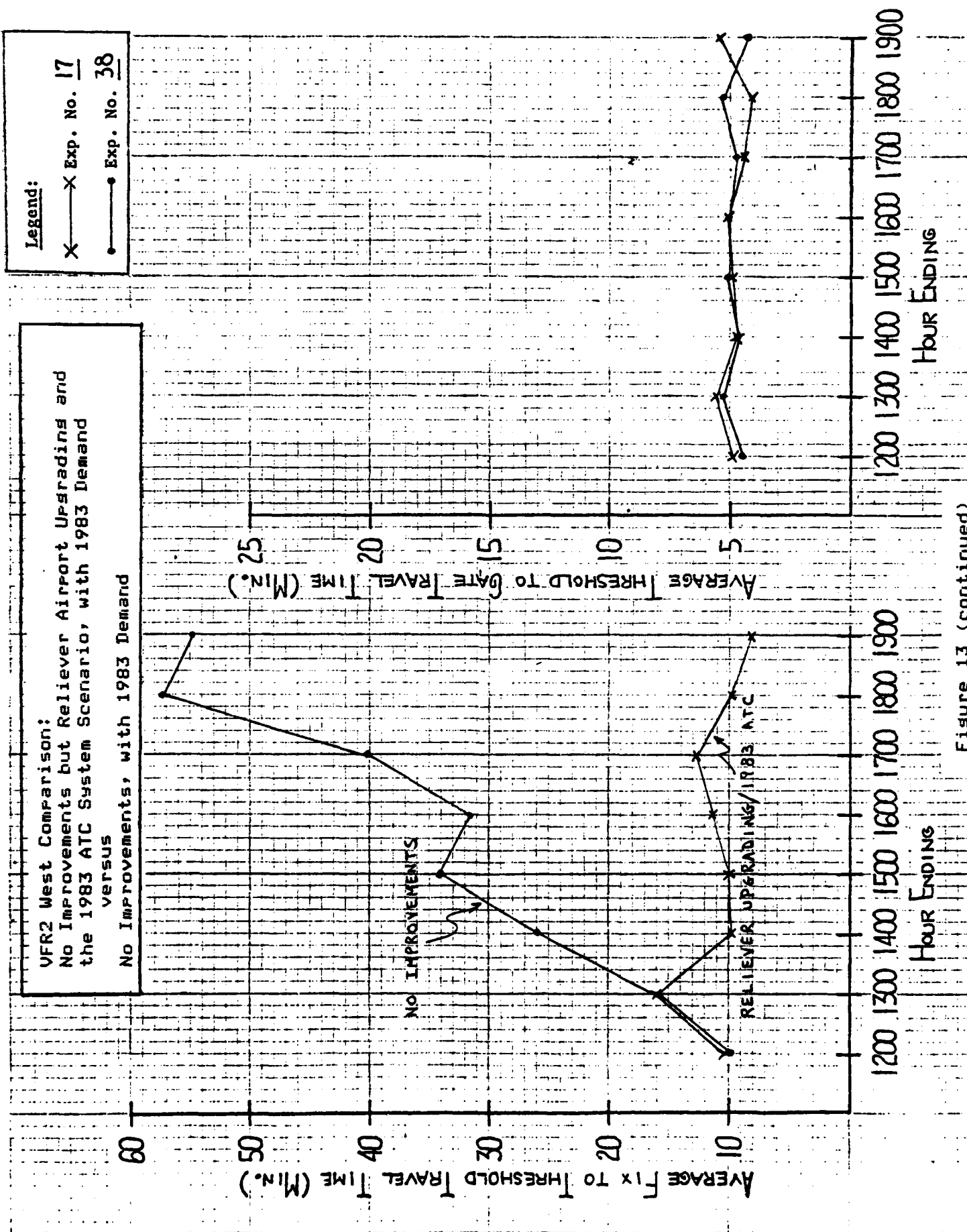


Figure 13 (continued)

## EXPERIMENT NO. 12

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR2 conditions, assuming the improved (1983) ATC system scenario and all Miami improvements including a 50-percent reduction in G.A. traffic due to Reliever Airport upgradings:

Arrival Runways

27R,30

Departure Runways

27L,27R

### Related Comparison Experiments:

Prior experiment 17 serves as the basis for comparison to this experiment, wherein the Miami-specific improvements were not included.

VFR2- Ceilings between 1000 ft. and 1500 ft. and  
visibility between 3 and 5 mi.

Data Package No. 4  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

## EXPERIMENT 12 RESULTS

MIAMI INTER. AIRPORT EXPER. -12 ROUTES=1983 CONFIG=B SEPAR=83VFR1 DEMAND=83  
AVERAGE FLOW RATES[illegible]

VFR2 West Comparison:  
All Improvements, with 1983 Demand  
versus  
No Improvements but Reliever Airport Upgradings and  
the 1983 ATC System Scenario, with 1983 Demand

ARRIVAL DELAY IN MINUTES

DEPARTURE DELAY IN MINUTES

RELIEVER UPGRADING/1983 ATC

RELIEVER UPGRADING/1983 ATC

ALL IMPROVEMENTS

ALL IMPROVEMENTS

1200 1300 1400 1500 1600 1700 1800 1900

Hour Ending

1200 1300 1400 1500 1600 1700 1800 1900

Hour Ending

Legend:

X Exp. No. 12

• Exp. No. 17

Figure 14

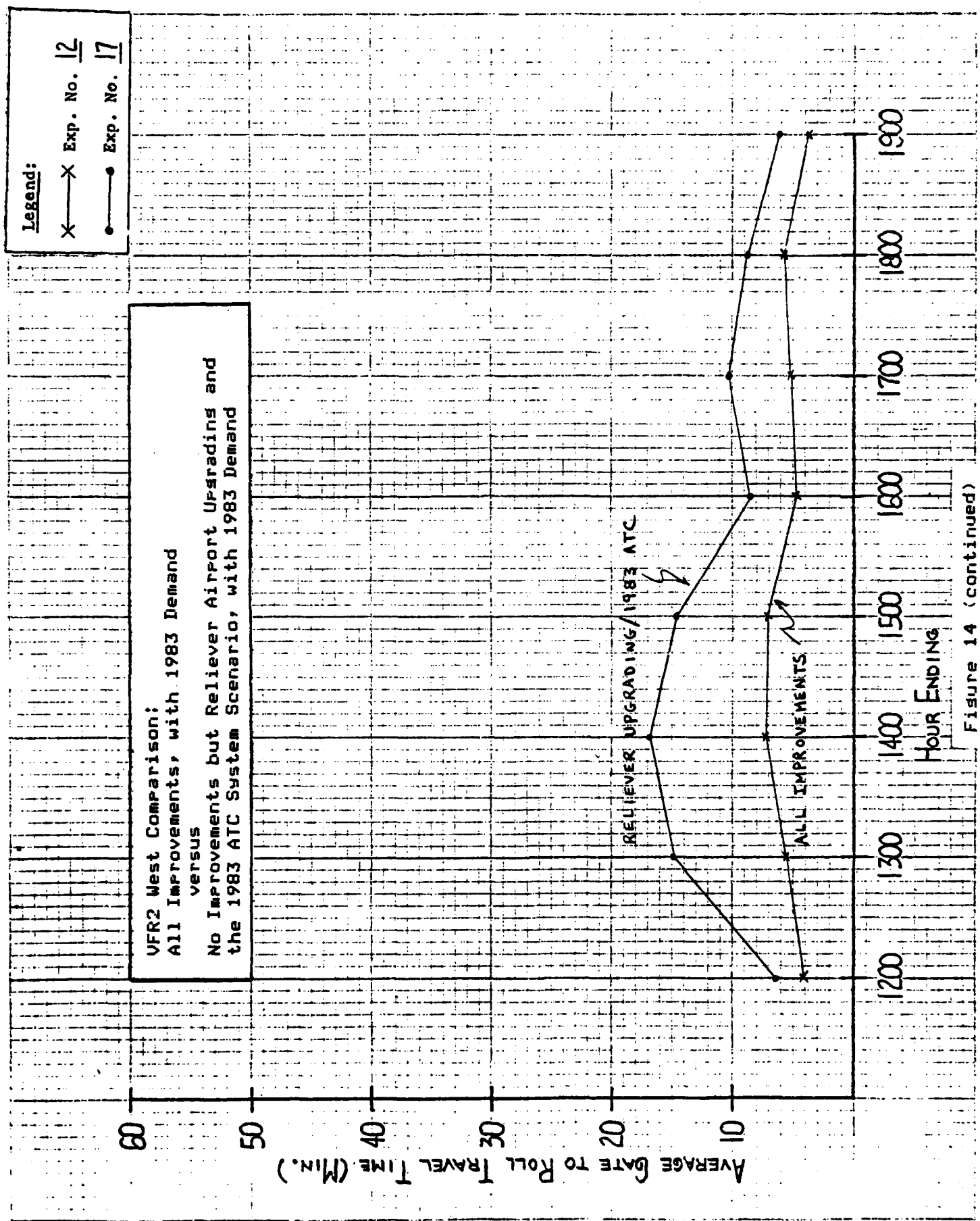


Figure 14 (continued)

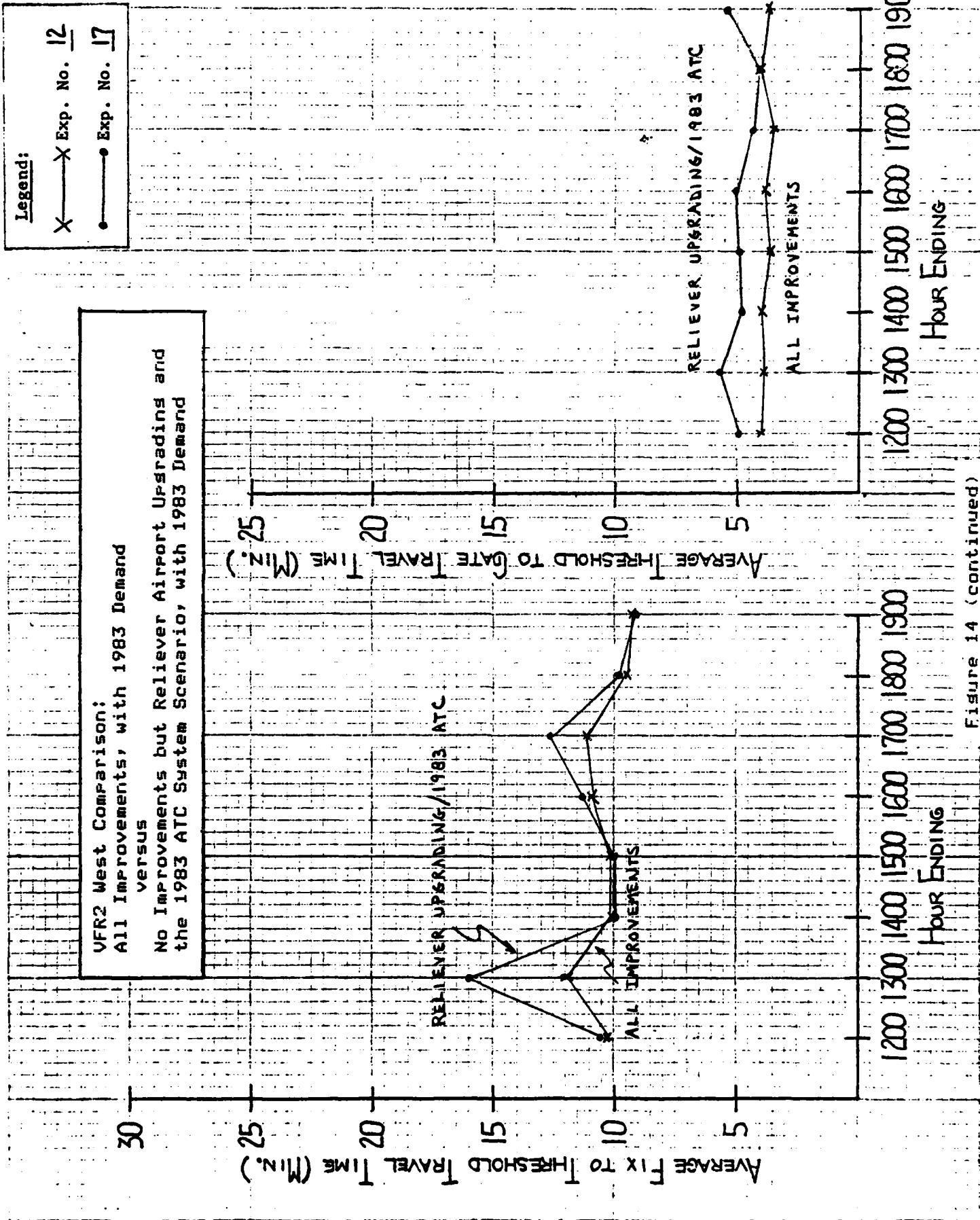


Figure 14 (continued)

## EXPERIMENT NO. 12A

### Objective:

To assess the delay impact of towing aircraft to and from maintenance areas in 1983 instead of taxiing them as defined by improvement item No. 10.

Arrival Runways

27R,30

Departure Runways

27L,27R

### Related Comparison Experiments:

Prior experiment 12 serves as the basis for comparison to this experiment, wherein the conditions of this study case were identical except that aircraft are being taxied instead of towed in experiment No. 12.

VFR2- Ceilings between 1000 ft. and 1500 ft. and  
visibility between 3 and 5 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 23

## EXPERIMENT 12A RESULTS

MIAMI INTER. AIRPORT EXPER.-12A ROUTES=1983 CONFIG=B SEPAR=B3VFR1 DEMAND=83  
AVERAGE FLOW RATES

TIME	ARRIVALS						DEPARTURES						AVERAGE TRAVEL TIMES TO						
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT DE- MAND	DIF	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT DE- MAND	DIF	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL		
1100-1200	20.0	0.0	27.4	0.0	0.0	0.0 47.4 54.0	-6.6	15.0	6.0	0.0	0.0	0.0	0.0 21.0 21.0	0.0	10.29	4.06	4.29		
1200-1300	25.0	0.0	30.6	0.0	0.0	0.0 55.6 50.0	-1.0	22.0	29.9	0.0	0.0	0.0	0.0 51.9 52.0	-1.1	11.91	4.44	5.80		
1300-1400	24.0	0.0	19.0	0.0	0.0	0.0 43.0 44.0	-2.0	26.2	26.1	0.0	0.0	0.0	0.0 52.3 57.0	-4.8	10.12	4.20	7.74		
1400-1500	24.0	0.0	19.0	0.0	0.0	0.0 43.0 42.0	-1.0	21.8	15.0	0.0	0.0	0.0	0.0 36.8 33.0	-1.0	10.12	3.97	8.08		
1500-1600	30.1	0.0	26.8	0.0	0.0	0.0 56.9 64.0	-8.1	15.0	19.0	0.0	0.0	0.0	0.0 34.0 34.0	-1.0	10.97	4.20	4.78		
1600-1700	17.9	0.0	25.2	0.0	0.0	0.0 43.1 35.0	-1.0	21.0	15.0	0.0	0.0	0.0	0.0 36.0 35.0	-1.0	11.13	4.09	6.39		
1700-1800	14.0	0.0	17.0	0.0	0.0	0.0 31.0 32.0	-1.0	25.0	34.0	0.0	0.0	0.0	0.0 59.0 62.0	-3.0	9.46	4.22	6.67		
1800-1900	9.0	0.0	23.0	0.0	0.0	0.0 32.0 31.0	-0.0	21.0	17.0	0.0	0.0	0.0	0.0 38.0 35.0	-0.0	9.21	4.18	4.02		
1900-2000	1.0	0.0	1.0	0.0	0.0	0.0 2.0 2.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0 0.0	-0.0	9.50	3.28	0.00		
AVERAGE DELAYS																		GRAND TOTAL	
TIME	ARRIVALS						DEPARTURES						AVERAGE DELAYS						
	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	TAXI IN	RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	TAXI OUT	RWY CRS	ARR DELAY	DEP DELAY		
1100-1200	1.1	0.0	1.4	0.0	0.0	1.3	.0	2.1	.5	0.0	0.0	0.0	1.6	.1	0.0	1.3	1.7		
1200-1300	2.1	0.0	3.5	0.0	0.0	2.9	.6	4.1	1.7	0.0	0.0	0.0	2.7	.1	0.0	3.5	3.7		
1300-1400	1.6	0.0	.4	0.0	0.0	1.1	.3	7.7	1.1	0.0	0.0	0.0	4.4	.0	0.0	1.4	5.3		
1400-1500	1.2	0.0	.6	0.0	0.0	1.0	.1	7.6	.5	0.0	0.0	0.0	4.7	.0	0.0	1.4	5.3		
1500-1600	2.2	0.0	1.2	0.0	0.0	1.7	.4	2.7	1.4	0.0	0.0	0.0	2.0	.1	0.0	2.1	2.5		
1600-1700	.6	0.0	3.1	0.0	0.0	2.1	.6	3.4	1.1	0.0	0.0	0.0	2.4	.0	0.0	2.6	3.5		
1700-1800	.1	0.0	.6	0.0	0.0	.4	.1	2.9	3.0	0.0	0.0	0.0	3.0	.1	0.0	.6	4.2		
1800-1900	.1	0.0	.3	0.0	0.0	.3	0.0	1.2	.9	0.0	0.0	0.0	1.1	.0	0.0	.7	1.6		
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		



VFR2 West Comparison:  
All Improvements but taxiing, with 1983 Demand  
versus  
All Improvements, with 1983 Demand

Arrival Delay in Minutes

30

25

20

15

10

5

Departure Delay in Minutes

25

20

15

10

5

1200 1300 1400 1500 1600 1700 1800 1900

Hour Ending

TAXIING/TOWING

1200 1300 1400 1500 1600 1700 1800 1900

Hour Ending

TOWING

TAXIING

Legend:

X Exp. No. 12A

• Exp. No. 12

Figure 15

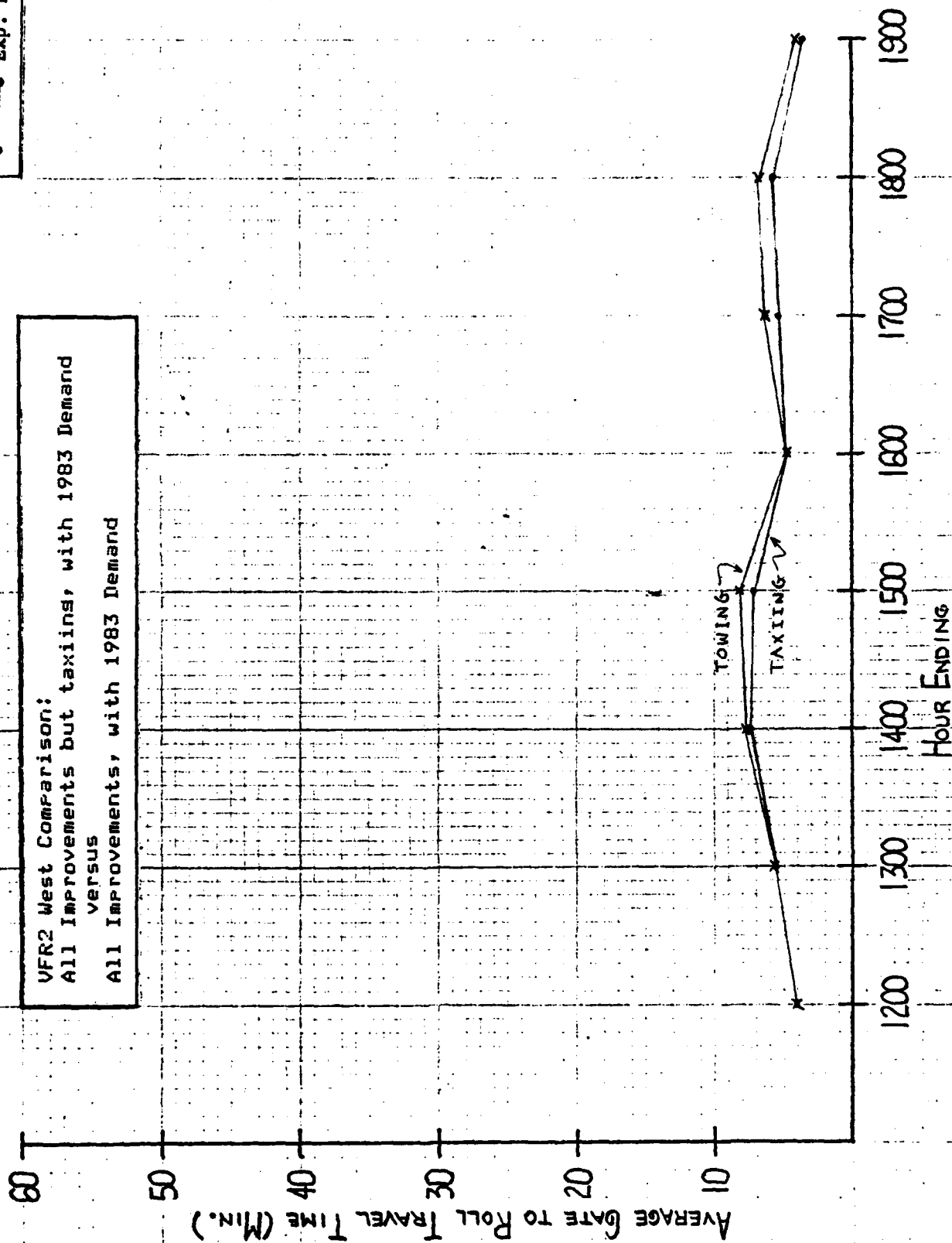


Figure 15 (continued)

VFR2 West Comparison:  
All Improvements but taxiing, with 1983 Demand  
versus  
All Improvements, with 1983 Demand

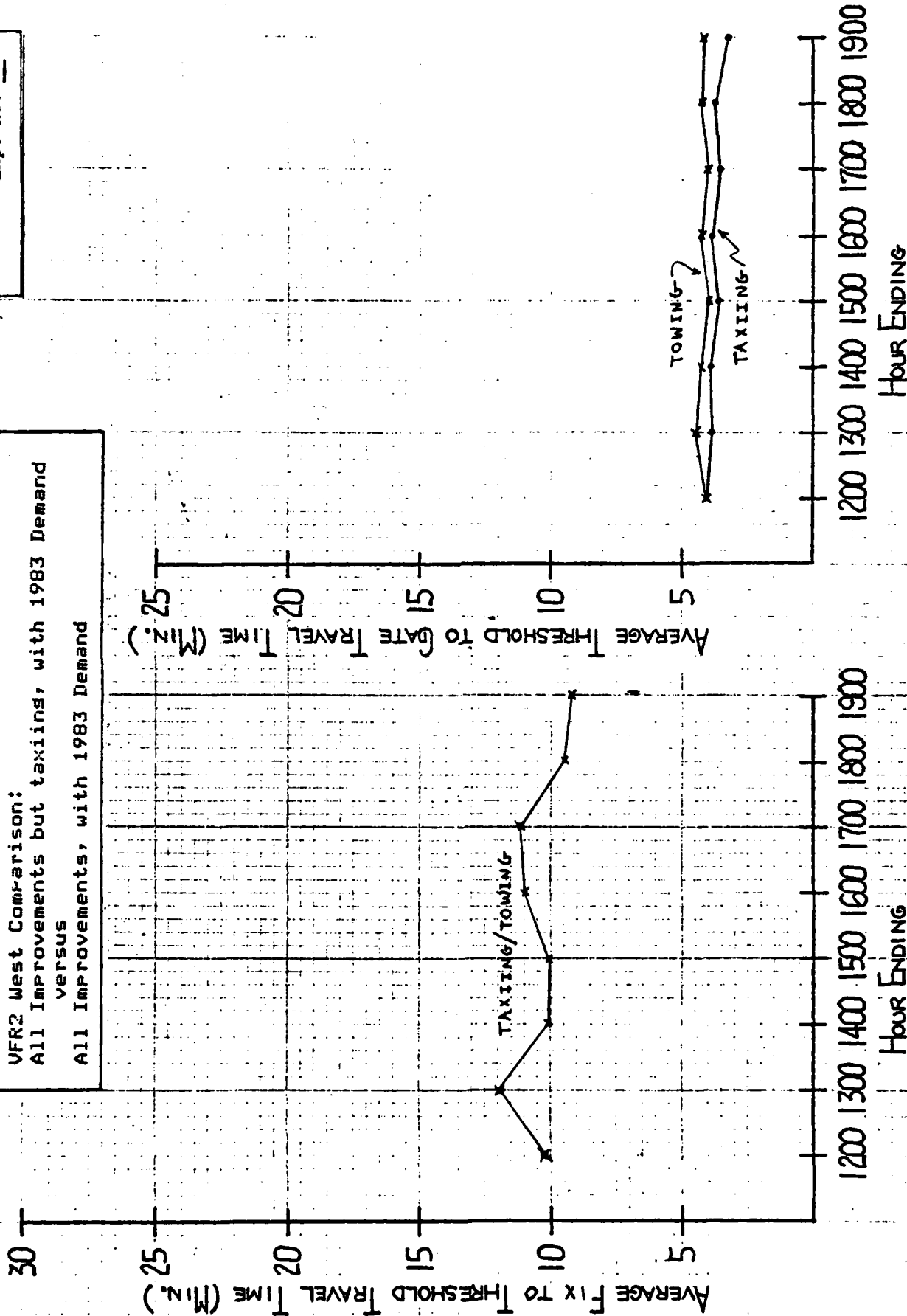


Figure 15 (continued)

TABLE 24

SET 4 DEMAND  
IFR, WESTERLY FLOW

EXPERIMENT NUMBER		RUNWAY 27R	RUNWAY 27L	RUNWAY 30	TOTAL
15  (39)	ARRIVALS	197	150	0	347
	DEPARTURES	165	167	0	332
	TOTAL	362	317	0	679
20	ARRIVALS	197	141	0	338
	DEPARTURES	153	161	0	314
	TOTAL	350	302	0	652
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				
	ARRIVALS				
	DEPARTURES				
	TOTAL				

## EXPERIMENT NO. 15

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami improvements except for Reliever Airport upgrading:

Arrival Runways

27L, 27R

Departure Runways

27L, 27R

### Related Comparison Experiments:

Prior experiment 39 (Data Package No. 5) serves as the 1983 demand level baseline for comparison to this experiment.

Experiment 20 assesses the expected delays after reducing the G.A. traffic of this study case by 50-percent.

IFR1- Ceiling between 200 ft. and 1000 ft. and/or  
visibility between 2400 ft. RVR and 3 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 25

## EXPERIMENT 15 RESULTS

MIAMI INTER. AIRPORT EXPER.-15 ROUTES=1983 CONFIG=B SEPAR=831FR1 DEMAND=83

## AVERAGE FLOW RATES

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE DELAYS			DIF	AVERAGE TRAVEL TIMES		
	RWY 27R	RWY 27L	RWY 30	RWY 27R	RWY 27L	RWY 30		TOT DE-MAND	TOT RWY	TOT DE-MAND		FIX TO THRESH	THRESH TO GATE	ROLL GATE TO
1100-1200	22.3	23.5	0.0	0.0	0.0	0.0	-4.2	45.8	50.0	4.2	-6.7	10.62	4.69	5.22
1200-1300	30.3	22.2	0.0	0.0	0.0	0.0	-5.7	52.5	54.0	-0.5	-19.6	12.35	4.99	14.20
1300-1400	25.4	19.3	0.0	0.0	0.0	0.0	-0.0	44.7	39.0	-5.7	-29.2	12.14	4.20	20.65
1400-1500	23.9	16.0	0.0	0.0	0.0	0.0	-1.1	39.9	41.0	-1.1	-9.4	13.90	4.58	32.38
1500-1600	29.4	24.3	0.0	0.0	0.0	0.0	-7.4	53.7	60.0	-6.3	-11.9	13.75	4.73	17.71
1600-1700	26.7	20.7	0.0	0.0	0.0	0.0	-1.0	47.4	41.0	-6.4	-8.1	14.36	4.59	17.55
1700-1800	21.0	12.0	0.0	0.0	0.0	0.0	-2.0	33.0	34.0	-1.0	-14.9	10.22	4.33	12.87
1800-1900	18.0	12.0	0.0	0.0	0.0	0.0	-0.0	30.0	28.0	-2.0	-4.5	10.92	4.12	11.21
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	-4.1	0.00	0.00	2.45
GRAND TOTAL														

## AVERAGE DELAYS

TIME	ARRIVALS			DEPARTURES			DIF	AVERAGE DELAYS			DIF	AVERAGE TRAVEL TIMES		
	RWY 27R	RWY 27L	RWY 30	RWY 27R	RWY 27L	RWY 30		TOT DE-MAND	TOT RWY	TOT DE-MAND		FIX TO THRESH	THRESH TO GATE	ROLL GATE TO
1100-1200	2.6	1.1	0.0	0.0	0.0	0.0	0.2	1.8	0.0	0.0	0.0	2.0	2.0	2.8
1200-1300	5.1	2.1	0.0	0.0	0.0	0.0	0.7	3.9	0.0	0.0	0.0	4.6	4.6	12.1
1300-1400	5.8	1.0	0.0	0.0	0.0	0.0	0.2	3.8	0.0	0.0	0.0	3.9	3.9	18.2
1400-1500	6.1	.6	0.0	0.0	0.0	0.0	0.3	3.9	0.0	0.0	0.0	4.2	4.2	30.0
1500-1600	5.2	2.7	0.0	0.0	0.0	0.0	0.3	4.1	0.0	0.0	0.0	4.4	4.4	15.2
1600-1700	9.2	1.8	0.0	0.0	0.0	0.0	0.1	6.0	0.0	0.0	0.0	6.1	6.1	14.7
1700-1800	1.4	.4	0.0	0.0	0.0	0.0	0.2	1.0	0.0	0.0	0.0	1.2	1.2	10.2
1800-1900	2.5	1.3	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	2.0	8.8
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8

IFR1 West Comparison:  
All Improvements but Reliever Airport Upgradings,  
with 1983 Demand  
versus  
No Improvements, with 1983 Demand

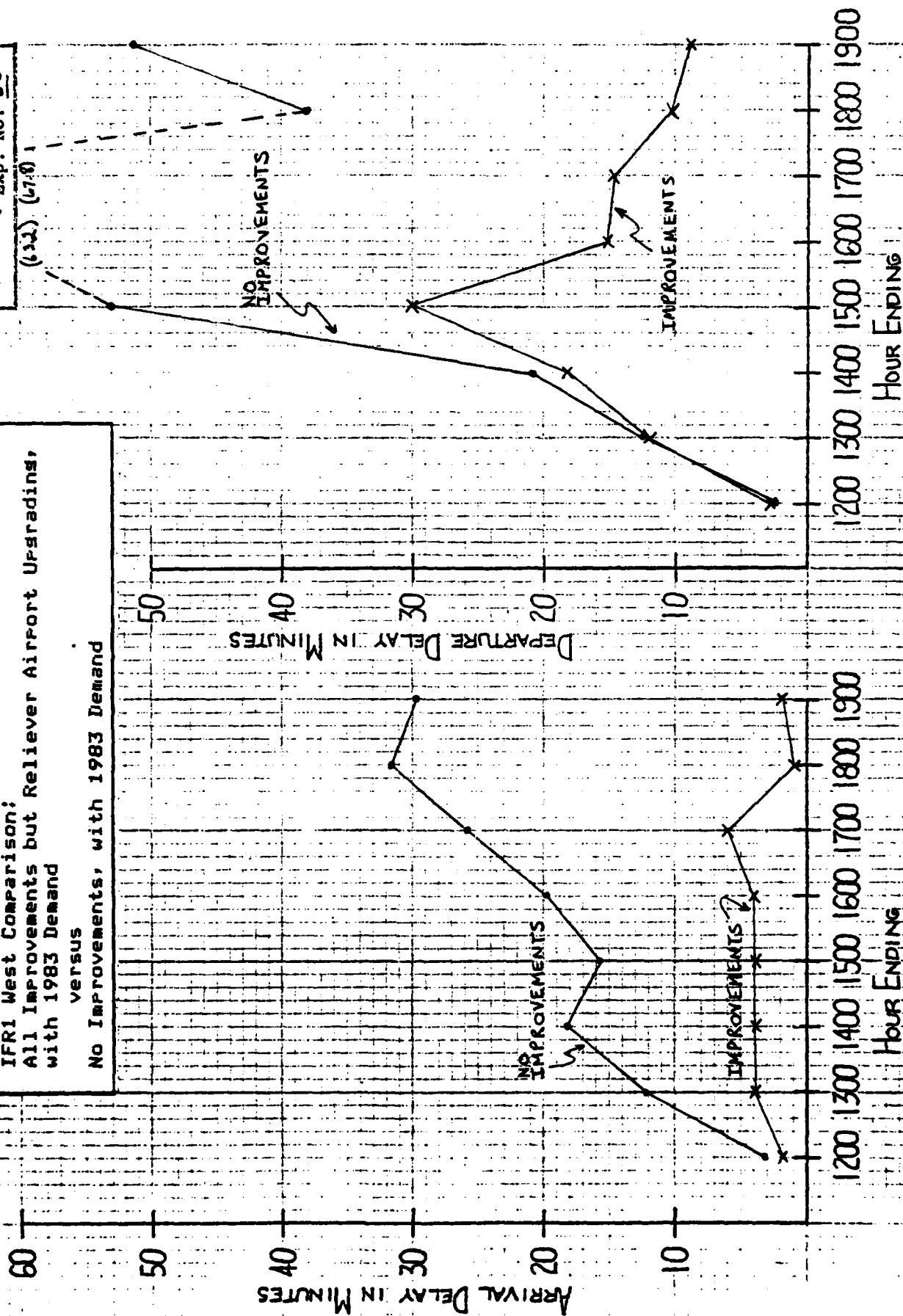


Figure 16

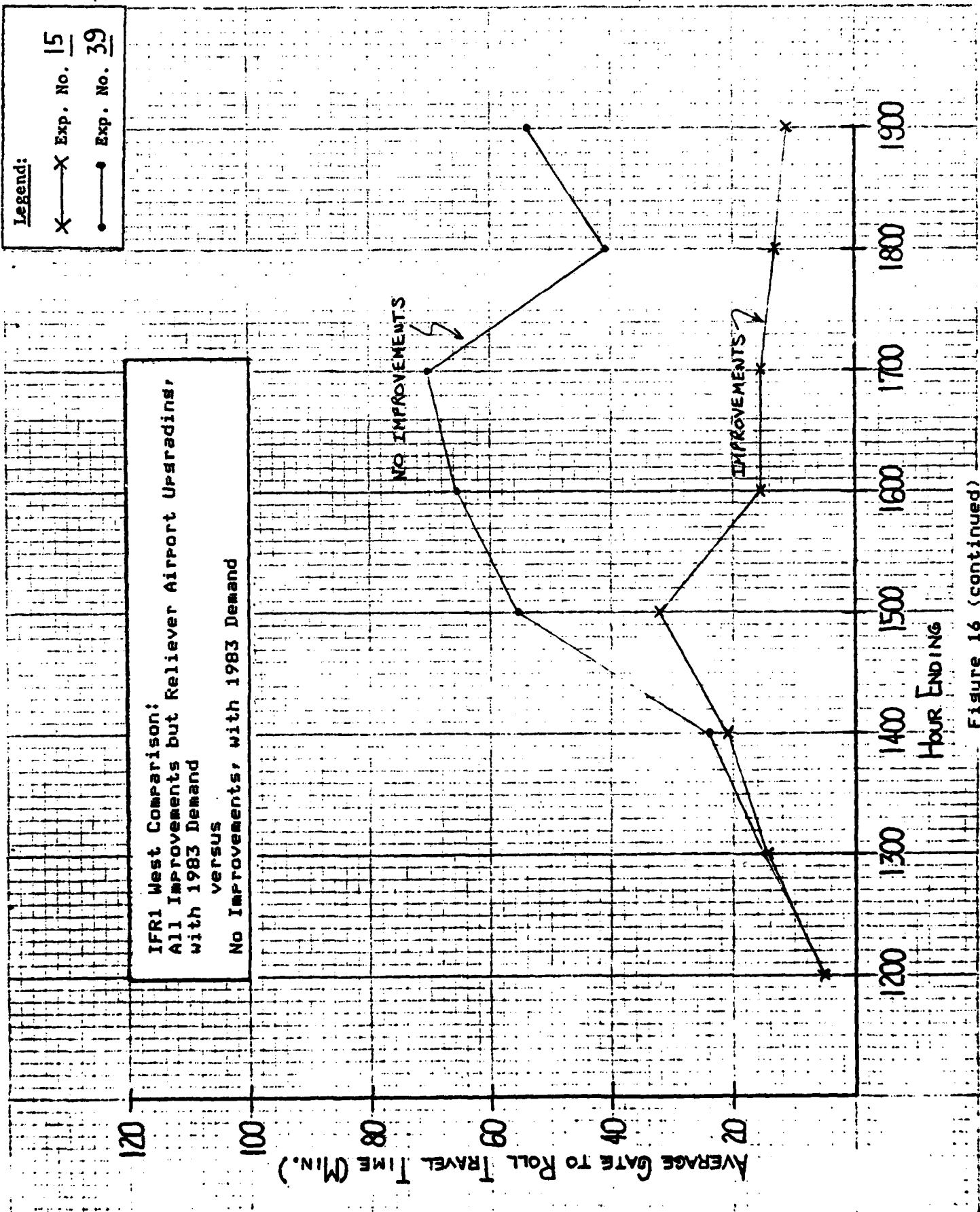


Figure 16 (continued)



IFR1 West Comparison:  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand  
versus  
No Improvements, with 1983 Demand

Legend:

X — Exp. No. 15

• — Exp. No. 39

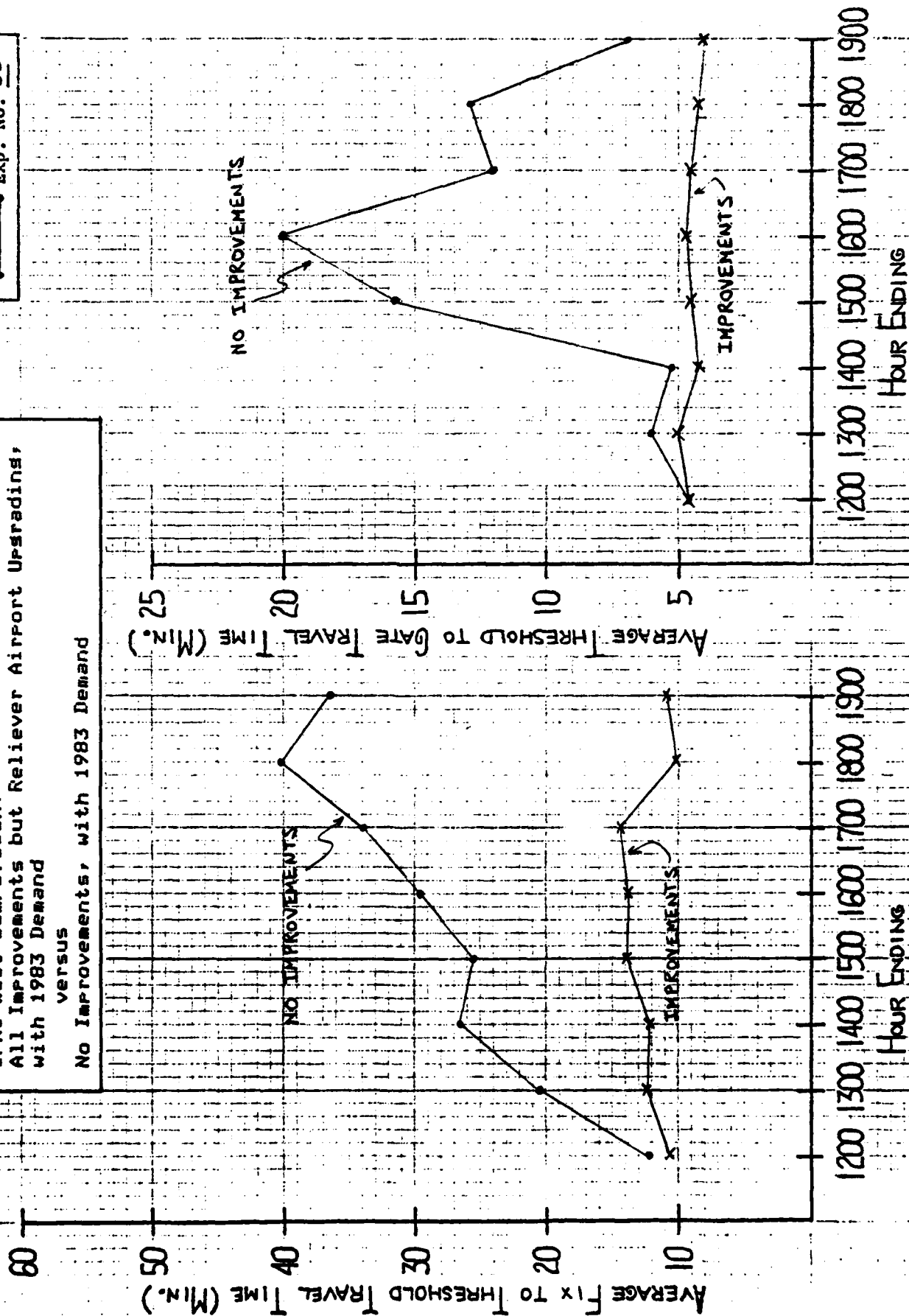


Figure 16 (continued)

## EXPERIMENT NO. 20

### Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming the improved (1983) ATC system scenario and all Miami improvements including a 50-percent reduction in G.A. traffic due to Reliever Airport upgrading:

Arrival Runways

Departure Runways

27L, 27R

27L, 27R

### Related Comparison Experiments:

Prior experiment 15 serves as the basis for comparison to this experiment, wherein the conditions of this study case were identical except for the 50-percent reduction in G.A. traffic due to the upgrading of Opa Locks and Tamiami.

IFR1- Ceilings between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.

Data Package No. 6  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
May 1980

TABLE 26

## EXPERIMENT 20 RESULTS

MIAMI INTER. AIRPORT EXPER.-20 ROUTES=1983 CONFIG=B SEPAR=831FR1 DEMAND=B3  
AVERAGE FLOW RATES

TIME	ARRIVALS				DEPARTURES				DIF	AVERAGE TRAVEL TIMES			
	RWY 27R	RWY 27L	RWY 30	RWY 30	RWY 27R	RWY 27L	RWY 30	RWY 30		FIX TO THRESH	THRESH TO GATE	GATE TO ROLL	
1100-1200	25.7	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.78	4.38	5.63	
1200-1300	31.2	27.0	0.0	0.0	0.0	15.8	18.2	0.0	0.0	20.39	6.27	16.41	
1300-1400	28.5	15.0	0.0	0.0	0.0	21.9	30.8	0.0	0.0	13.22	4.62	21.67	
1400-1500	20.6	19.0	0.0	0.0	0.0	27.0	22.0	0.0	0.0	10.27	4.49	26.82	
1500-1600	31.6	16.8	0.0	0.0	0.0	12.8	18.0	0.0	0.0	12.41	4.28	9.26	
1600-1700	27.4	17.2	0.0	0.0	0.0	19.5	15.0	0.0	0.0	17.10	4.23	10.49	
1700-1800	18.7	12.0	0.0	0.0	0.0	23.4	31.1	0.0	0.0	9.78	4.34	8.51	
1800-1900	13.3	16.0	0.0	0.0	0.0	18.6	19.3	0.0	0.0	9.79	4.62	6.98	
1900-2000	0.0	1.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	14.00	5.80	2.88	
AVERAGE DELAYS													
GRAND TOTAL													
TIME	ARRIVALS				DEPARTURES				DIF	AVERAGE DELAYS			
	RWY 27R	RWY 27L	RWY 30	RWY 30	RWY 27R	RWY 27L	RWY 30	RWY 30		ARR DELAY	DEP DELAY		
1100-1200	5.6	.4	0.0	0.0	0.0	4.0	.6	0.0	0.0	3.6	3.1		
1200-1300	20.3	1.3	0.0	0.0	0.0	14.3	12.4	0.0	0.0	13.1	14.2		
1300-1400	6.2	.5	0.0	0.0	0.0	20.8	7.3	0.0	0.0	4.5	19.4		
1400-1500	2.2	1.4	0.0	0.0	0.0	20.0	5.9	0.0	0.0	1.9	24.3		
1500-1600	3.9	.7	0.0	0.0	0.0	12.2	2.1	0.0	0.0	2.8	7.0		
1600-1700	12.5	.9	0.0	0.0	0.0	11.0	2.7	0.0	0.0	8.1	7.6		
1700-1800	.4	.3	0.0	0.0	0.0	4.9	6.3	0.0	0.0	.5	6.0		
1800-1900	.6	.4	0.0	0.0	0.0	3.9	3.7	0.0	0.0	.5	4.7		
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	2.1		

IFR1 West Comparison:  
All Improvements, with 1983 Demand  
versus  
All Improvements but Reliever Airport Upgradings,  
with 1983 Demand

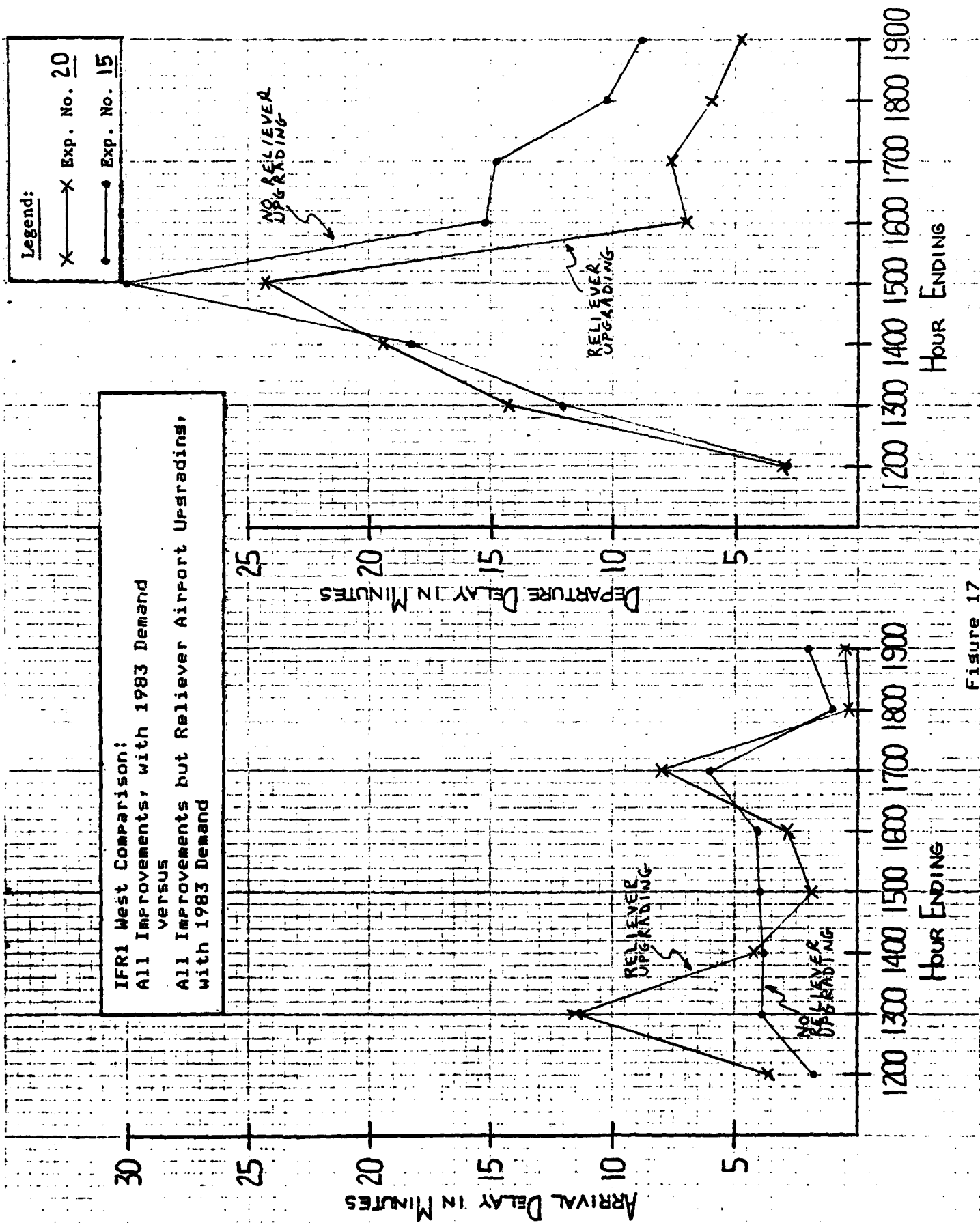


Figure 17

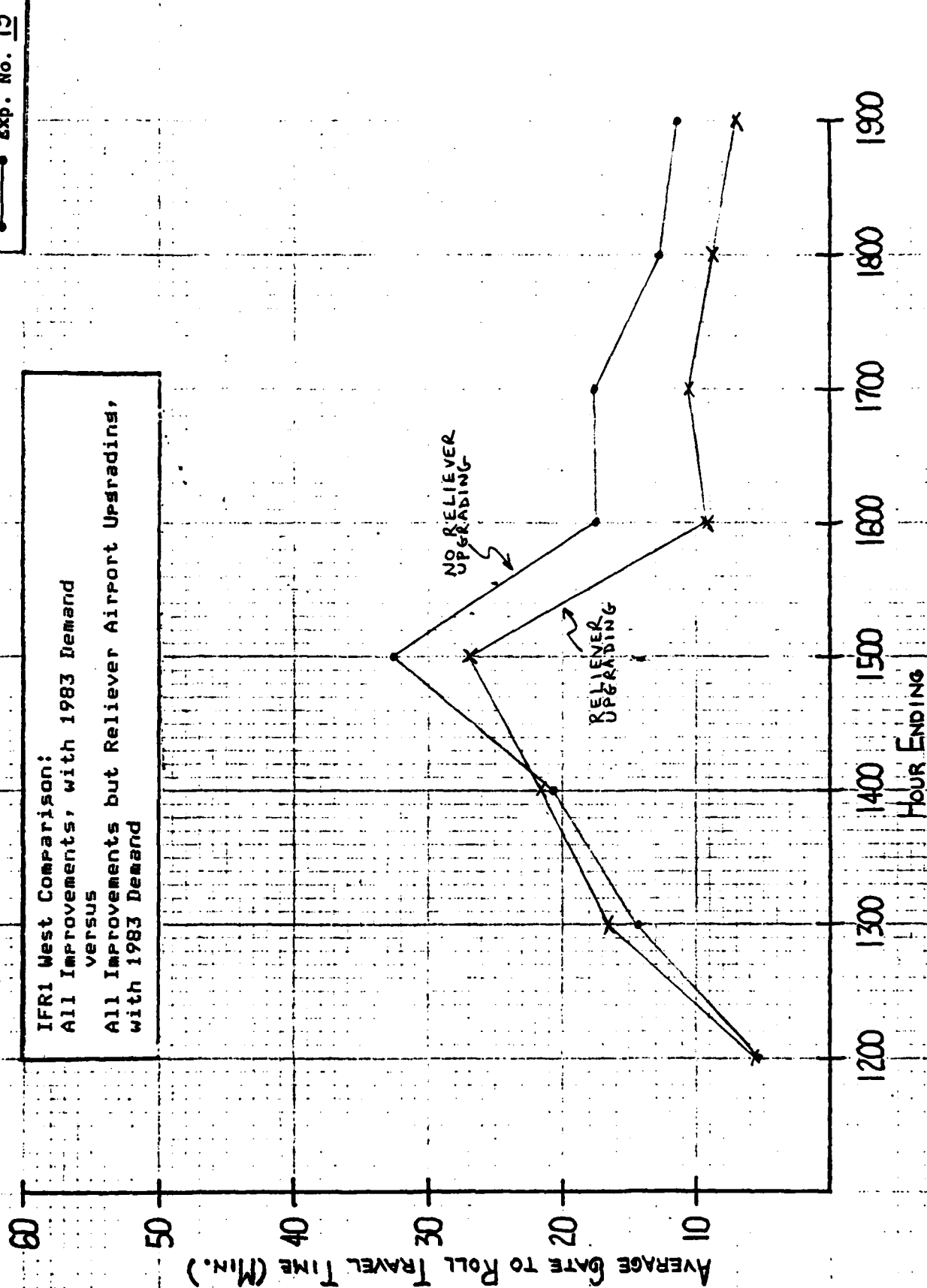


Figure 17 (continued)

IFR1 West Comparison:  
All Improvements, with 1983 Demand  
versus  
All Improvements but Reliever Airport Upgrading,  
with 1983 Demand

Legend:  
X Exp. No. 20  
● Exp. No. 15

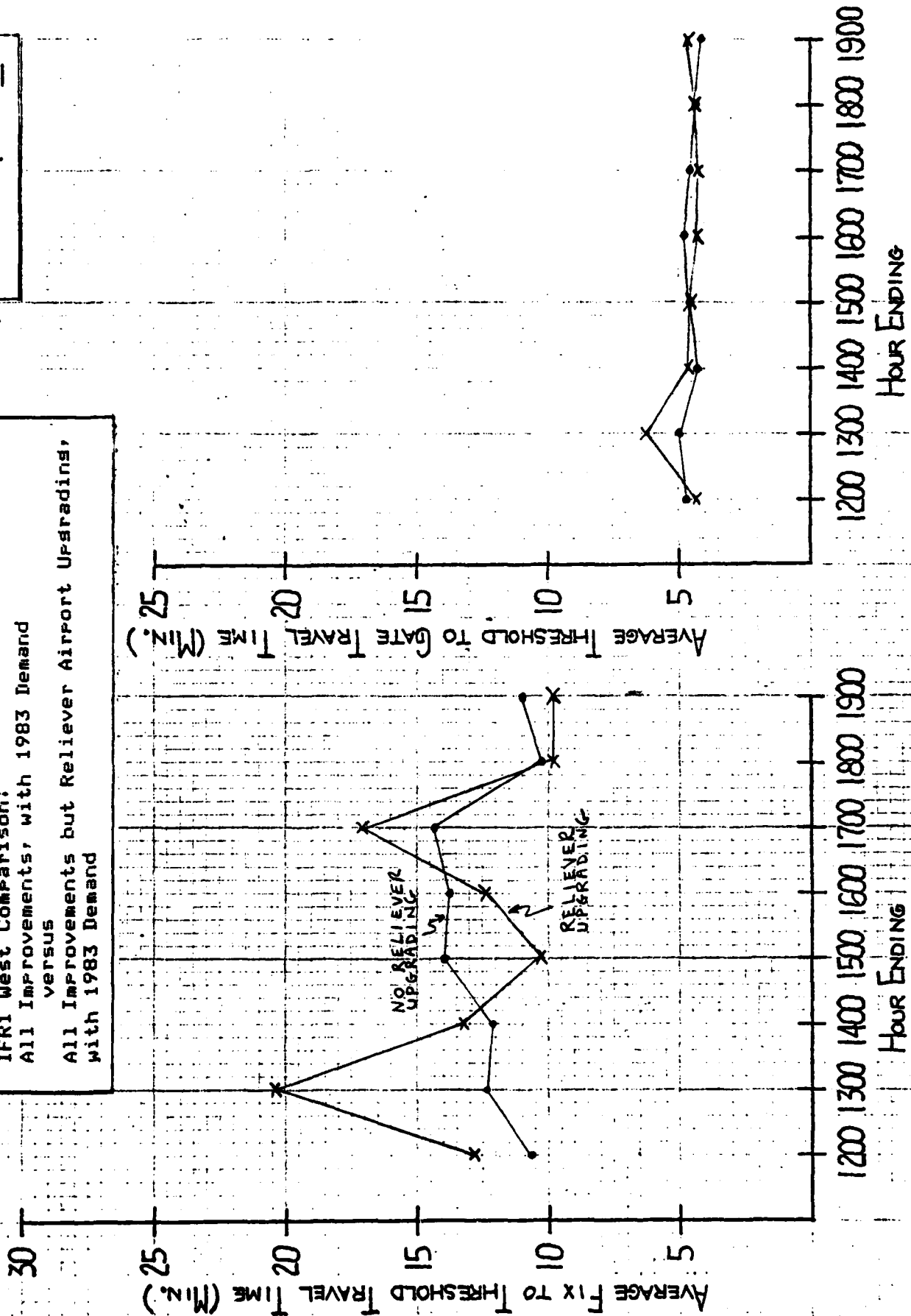


Figure 17 (continued)